THE CONDOR

A Magazine of Western Ornithology

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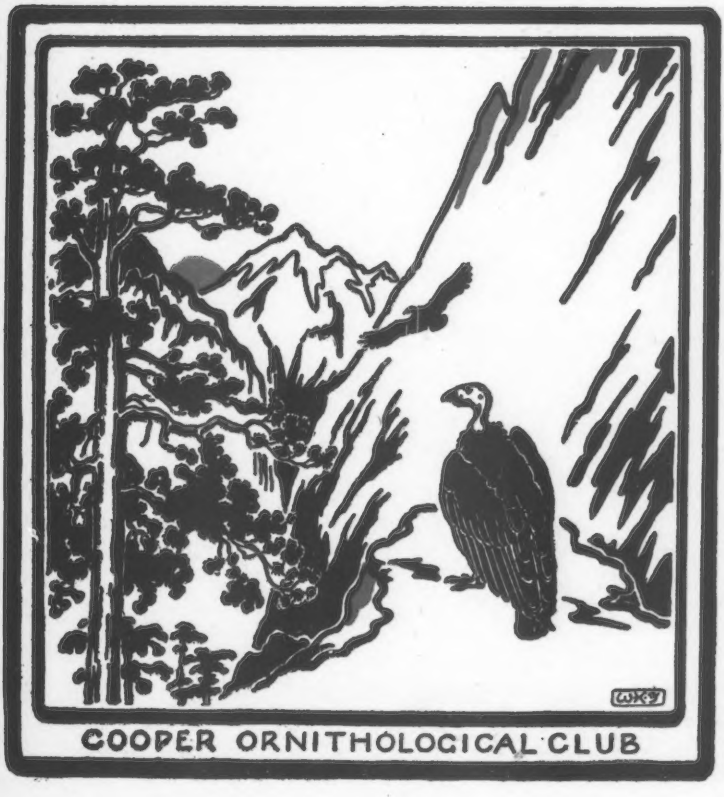

COOPER ORNITHOLOGICAL CLUB

THE CONDOR

A Magazine of Western Ornithology

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VOLUME XXIX SEPTEMBER-OCTOBER, 1927 NUMBER 5

CONTRIBUTION TO THE LIFE HISTORY OF THE ALASKA WILLOW PTARMIGAN

WITH THIRTEEN ILLUSTRATIONS

By JOSEPH DIXON

UPON THE DAY of our arrival at Mount McKinley National Park, on May 19, 1926, we found three male Alaska Willow Ptarmigan *(Lagopus lagopus alascensis)*, all in full nuptial plumage with chestnut heads and necks, but bodies pure white except for a few brown feathers just coming through on their backs. On the evening of May 24, at 6 o'clock, I heard a male Willow Ptarmigan "crow" and looking in the direction from which the sound came I saw what appeared to be a lump of snow on the flattened crown of a spruce tree about 200 yards from camp. Taking the binoculars I saw that the lump of snow was really the white body of a male ptarmigan. The spruce tree was bent and old and about thirty feet high (see fig. 60). The bird gave a couple of warning calls as I approached the tree, and then it dawned on me that he was probably standing guard while his nesting mate fed.

Fig. 60. Male Ptarmigan perched, on guard, in tree top.

So I hunted around; and sure enough, I found the female ptarmigan feeding in some dwarf willows about twenty feet from where I stood. As soon as I started after the female the male ptarmigan flew down from the tree top and ran off ahead of me, trying in various ways to decoy me away from his mate. The buffy brown female was hungry and had evidently just come off her nest. When moving from one feeding station to the next bunch of willows she kept to the hollows and depressions and sneaked along, with body, head and tail all low to the ground. When she remained motionless I had difficulty in making her out even when only twenty feet distant.

The behavior of the male was entirely different. He strutted about with tail sticking out stiffly behind. The head was carried erect and his neck was extended (fig. 61). The vivid coral red comb over each eye was carried erect and was conspicuous to a dis-

tance of fifty feet. He kept hiding by running behind trees, but when a little way off he would mount a tundra tussock or rock and give his coarse warning "cackle" which sounds like running a nail over a stiff comb.

The hungry female fed steadily on willow buds, and while she was thus engaged the male courted her by strutting around her with tail spread to the utmost; the wings were flexed downward, and the feathers of the body were fluffed out just as they are in a strutting turkey cock. This display was repeated several times (fig. 62), but the hen kept right on foraging. I followed the birds about for nearly an hour, hoping that the female would go onto her nest; but she was too wise for me and I finally lost her in a little thicket of willows.

Fig. 61. MALE PTARMIGAN ALARMED, WITH NECK EXTENDED AND COMBS ERECTED.

About 7 o'clock in the evening of May 25 the sun shone brightly for a few minutes and looking over at the spruce grove we saw our cock ptarmigan perched in the tip top of one of the tallest trees. Then the snow began suddenly to fall and when we looked again he was gone. When we reached the lower edge of the grove we found him walking along quietly near the spot where we usually found the female. When the snow fell he fluffed out his feathers so that his body appeared almost as round and white as a pop-corn ball. He closed his eyes and acted just like a sleepy, contented chicken going to roost (fig. 63). When I moved he came suddenly to life, stretched his neck, cackled, and then ran away. He made no effort to fly and by working up very slowly I managed to get within eight feet of him, at which distance I secured several photographs.

When the male ptarmigan is alarmed the red combs over his eyes stick up in a vertical position (fig. 61). When the bird is at rest, the combs are relaxed somewhat and are not nearly so noticeable (fig. 63). In repose, the feathers of the body are fluffed out, making the bird appear much larger than he really is. When frightened the feathers are drawn up close to the body.

The male ptarmigan spends the day hiding in little thickets, keeping within 50 or 100 feet of the nest. He has a definite form or nest of his own which he occupies when roosting. One reason for his staying so close is the danger of Short-billed Gulls finding the ptarmigan's nest. These egg thieves work in organized gangs, usually three to-

Fig. 62. MALE (AT RIGHT) STRUTTING AROUND FEMALE (LOWER LEFT).

Fig. 63. MALE IN REPOSE; COMBS DEPRESSED, PLUMAGE FLUFFED OUT.

gether. One will swoop down at the female, trying to make her shift about on the nest so as to expose the eggs. The second or third gull following tries to slip in and grab an egg. As soon as the gulls appear, the hen ptarmigan gives a peculiar call for help. Upon hearing this the cock ptarmigan bursts forth like a rocket and charges the thieving gulls. He doesn't beat around the bush but flies directly at the intruders, knocking them down with the impact of his body. An average cock Willow Ptarmigan at this season weighs 507 grams, while one of the Short-billed Gulls which was shot weighed 358.2 grams. In addition to being one-third heavier than the gull the cock ptarmigan flies much the faster of the two, and when he hits a gull it is almost like a Duck Hawk striking a duck.

I had been told of an instance where a cock Willow Ptarmigan had attacked and routed a large grizzly bear that happened to stumble upon his nest. But even after seeing the ptarmigan drive off the gulls I did not fully appreciate the furiousness of the attack, until June 23, when I came across an old hen ptarmigan with her brood of small young which were just able to fly. I rushed after the young, trying to catch one. Just as I was about to grab a chick, a willow bush in front of me exploded and the cock ptarmigan flew directly into my face, knocking my glasses to one side as he slapped my face with his beating wings. He then dropped to the ground, but instead of retreating flew directly into my face again; but this time I was ready for him and caught him with my bare hands when he became mixed up with my mosquito head net. The bird then tried to bite and to flap his way to freedom. As I started off with the cock under my arm the hen ptarmigan left her young and came rushing at me and then crawled feebly about at my feet as though in mortal agony. When I started away she rushed frantically about flapping my heels with her wings at every step. Every time she rushed at me she hissed. When the male found he could not escape he uttered a few croaking notes and the hen left me at once and went back to her chicks.

Fig. 64. IN COMMAND OF THE FIELD.

I took the cock to camp, which was nearby, to photograph him. Then I carried him back to the place where I had caught him. When I turned him loose he wanted to fight me again. I thought such a valiant bird ought to be encouraged and perpetuated, so I backed off leaving him in command of the field (fig. 64).

A nest found May 21 was located in a thin bunch of brush right out in the open. It was placed on a clump of reddish moss which was almost the color of the female ptarmigan. It was very difficult to see the female on the nest even when the sitting bird was in plain sight at a distance of 15 feet. The female allowed me to take pictures of her on the nest at arm's length and I finally reached out and stroked her back and still she did not leave her nest.

On June 7 I again visited this ptarmigan nest. For the past three mornings the hen had been off the nest feeding at 6 o'clock, but this morning she was on the nest at

6:05 when I arrived. I looked about and at length found the cock ptarmigan hiding in a sort of nest wallowed out between two bushes about 40 feet from the real nest. This is his home, and he repairs to it regularly while the female is on the nest. I tried to get some photos of the male but he kept "cackling" and leading me away from the vicinity. He proved an excellent decoy.

I then flushed the hen from her nest which contained nine eggs (fig. 65). When forced off the nest the hen "clucked" and "fussed" about, even pretending that she was incubating her eggs (fig. 66). Finding that this ruse did not work, she arose, fluffed out her feathers, shook herself and scooted, with head and tail close to the ground, to the creek nearby. Here she waded boldly out into the water and drank thirstily (fig. 67). After drinking, she fed industriously for ten minutes on buds and leaves of willow and then returned in a round-about way to her nest (fig. 68). While the hen was on the nest I followed the cock about. When we were almost 100 yards distant the female on the nest called, and the cock arose promptly and flew back across the

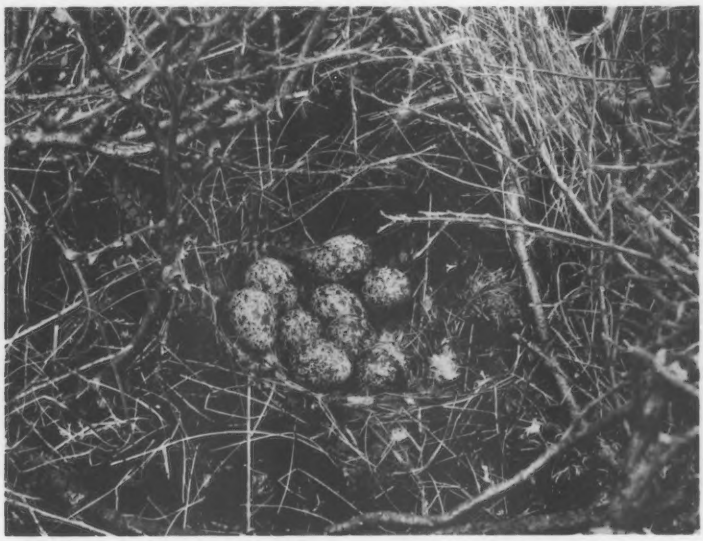

Fig. 65. A TYPICAL NEST OF THE ALASKA WILLOW PTARMIGAN; MOUNT McKINLEY NATIONAL PARK, JUNE 1, 1926.

creek to her. She then came off and they fed together, keeping up a low conversational clucking the while.

When this ptarmigan nest was found, on May 21, the female was on and the nest contained nine eggs which were nearly or quite fresh. The first egg hatched at 4 p. m. on June 14. Three hours later eight eggs had hatched, and the mother ptarmigan then left the nest with her brood of eight downy, but able-bodied young (fig. 69). One of the nine eggs failed to hatch and was abandoned and left in the nest (see fig. 70). The period of incubation was in this instance known to have been between 24 and 25 days.

When the ptarmigan chicks hatched, the egg-shells were broken around near the middle from the inside and the top of the shell was lifted off. These top portions of the shells were not found in the nest along with the other empty shells and the one un-

Fig. 66. WHEN FORCED OFF HER NEST, THE FEMALE PTARMIGAN FUSSED ABOUT LIKE A SITTING HEN.

Fig. 67. FEMALE PTARMIGAN DRINKING, HAVING WADED OUT INTO A SHALLOW STREAM.

hatched egg (fig. 70). I looked around near the nest but could find no trace of egg-shells outside the nest. What became of these portions of the egg-shells remains a mystery.

The hen spent the night hovering the young within fifty feet of the nest, but having once left the nest the family never returned to it. While the eggs were hatching the cock was on hand at the nest and appeared much excited. When several Short-billed Gulls appeared and tried to steal the young the male ptarmigan became almost beside himself with anger and flew directly at the gulls and drove them off.

The following morning at half past six we found the entire family, cock, hen and their eight downy young, all together in some low brush about 100 feet from the nest.

Fig. 68. THE BROODING FEMALE PTARMIGAN.

The hen was fluffed out with all eight chicks under her. One youngster stuck his head out from behind her wing, and another chick tried to crawl beneath her (fig. 71). Later, a chick perched on her back but slid off before I could photograph him. When we first came up, the cock was hidden in a bush about six feet from his mate. The hen and chicks were so protectively colored that it was difficult to make them out at a distance of ten feet, unless they moved. However, with the cock it was a different matter. His reddish-brown head, neck and back, and large size, made him relatively conspicuous. He seemed to realize that his presence was likely to handicap, or even to endanger, the rest of the family; consequently he sought to conceal himself as much as possible near the family where he could and did repel thieving gulls and other invaders. Upon our close approach, the hen rushed out to attack us, with drooping wings and feathers fluffed out just like a "sitting" hen. After making several feints or actual attacks she returned to her chicks and seemed to accept us as her friends.

The call notes of the mother, written down on the spot, were as follows:

1. Harsh *ke - oukˊ* — *ke - oukˊ* = warning! danger!
2. Soft purring *keer - er - eerkˊ* = hush-a-bye, when hovering young.
3. Clucking *cuckˊ - cuckˊ* = note used to call chicks to her so that she could hover them.

Fig. 69. A BROOD OF EIGHT, DAY-OLD PTARMIGAN CHICKS: COUNT THEM !

Fig. 70. EIGHT OUT OF NINE EGGS HATCHED.

The downy chicks uttered a soft *cheep cheep cheep,* especially when they were in distress or had become lost from the rest of the family. This faint call was not audible to my ears at a distance greater than twenty feet, but both cock and hen were able to hear it up to fully forty feet. The mother ptarmigan kept "talking" in a subdued tone to the chicks. This served as encouragement when the chicks became weary and lagged behind and at other times served as a lullaby to quiet them when she was hovering them. The cock was usually silent, but gave a hoarse throaty *c-o-a-k,* repeated several times in succession, when danger threatened. This warning note was always given as soon as the cock spied a Short-billed Gull in the neighborhood. We found that the cock kept a sharp lookout for gulls, and that he would often see them coming before we did. When the mother hovered the chicks the cock ptarmigan, after seeing that they were safe, seemed to realize that he was too conspicuous and hence a source of danger to the family. Accordingly he would always go off six to ten feet to one side and hide in the bushes. Here he would peer out cautiously and keep a sharp watch for gulls, foxes, or other sources of danger.

The cock ptarmigan is relatively ragged. His wedding suit is in tatters now, and he is a conventional family man with the rusty barred feathers of his summer plumage coming in on his head, neck and back. The chicks appear very much like young turkeys. They are covered clear to the toes with yellow down trimmed with stripes of brown. There is a broad brownish stripe on the top of the head which divides into two narrower stripes that extend down the center of the back. There is also a brown stripe back of the eye and a brown bar on the wing. All the brown stripes have a reddish tinge.

The adult birds feed on the tender green leaves of the dwarf willow with an occasional insect picked up whenever it comes handy. The eight chicks foraged in a loose flock covering an area about five feet wide and six feet long. They pursue small insects and mosquitoes which they run down or reach up for and pick off the grass. I watched one chick catch a cranefly and after hammering and pecking at it awhile he concluded that it was too tough, gave it up as a bad job, and left it. The stomach of a four or five day old chick was preserved in alcohol and submitted to the Biological Survey for detailed examination. Here it was examined by Mr. Charles C. Sperry of the Food Habits Research Division who reports the stomach contents as follows: "Condition of stomach full; percentage of animal matter, 100; contents, 4 beetle larvae (Chrysomelid?), 8%; 1 plant louse (Aphididae), 1%; Diptera: 1 *Orthoclodius* sp., 1 *Empis* sp., 1 *Rhamphomyia* sp., 1 *Helina* sp., 2 *Sciara* sp., 1 *Coenosia ansoba* and 3 *Spania,* 15%; 17 yellow caterpillars, 74%; 1 spider, trace; 15 Thysanura, 2%." It will be seen from this stomach examination that caterpillars formed the greater part of the stomach contents of this ptarmigan chick.

The family travelled as follows: First came two or three chicks in the thick grass, then the mother surrounded by the other chicks; the cock sometimes led and at other times brought up the rear. I timed them and found that they covered a lineal distance of 45 feet in five minutes. Following this there came a period of rest of five minutes, during which the mother hovered her brood of young. We never saw the cock hover the young; but when one of the chicks became entangled in a network of twigs he was right there and helped it get free. By noon the ptarmigan family had wandered out in the low bushes 100 yards from where they had hatched. The chicks were now nearly 24 hours old, and all of them were strong and lusty, each able to run about with agility and to secure food for itself.

At Copper Mountain, about 4 o'clock in the afternoon of July 12, a family of Willow Ptarmigan came feeding along through the dwarf willows near camp. There were six young about the size of quail. The cock kept a lookout for enemies from elevated

Fig. 71. CHICK CRAWLING BENEATH MOTHER PTARMIGAN; THE OTHER SEVEN CHICKS ARE ALREADY BENEATH HER.

Fig. 72. THE COCK PTARMIGAN IS AN IDEAL FATHER, SHARING EQUALLY WITH THE HEN THE RESPONSIBILITY OF WATCHING OUT FOR THE CHICKS.

positions while the hen herded the young along through the willows. The hen kept up a running conversation with the young as did also the cock. This liaison note was a loud *ke-ouck,* repeated at intervals of from five to ten seconds. The cock's call was somewhat coarser than that of the hen. I had difficulty in hearing the thin peeping of the chicks at a distance of fifty feet, but it served to keep them together. The young were very active, jumping up into the willows and catching insects over a foot off the ground.

At Copper Mountain, on July 13, I found a pair of Willow Ptarmigan wading about in the mud and shallow water where a glacial stream was flooding a portion of the valley. This rise in the water forced the bugs and insects to climb up into the tops of the low fireweed, and the ptarmigan were there able to wade about and pick the insects up with ease.

On June 7, in a bunch of willows, I found a gang of 25 Willow Ptarmigan, all of which were males. They were in a compact flock like quail. It seems that after the eggs are laid, and the females need less attention, the male ptarmigan often gather into flocks or "clubs" to feed, probably for mutual protection from foxes and other natural enemies. It is possible that some of these males may have been bachelors that failed to find mates, but examination of birds shot for specimens indicated that most of the males had bred recently. It is my opinion that these "stag" parties are only temporary, since the males were often heard flying about together and cackling hoarsely, usually late at night. Not all of the males joined these midnight parties, because where we found broods of downy young they were accompanied by both parents (fig. 72).

In going past a willow thicket I happened to sneeze, and in doing so made a noise very much like a red fox barking. At once one of the ptarmigan gave a warning cackle and then the whole flock of 25 ptarmigan flew up, perching in the tops of the willows, high off the ground. Here they craned their necks and looked about in every direction, evidently trying to locate the fox.

The enemies of the Willow Ptarmigan are numerous and varied. Perhaps the red fox heads the list of such enemies. We found four red fox dens near our camp. The ground about each of these dens was strewn with rabbit feet and ptarmigan wings. An examination of such remains showed that ptarmigan were captured more frequently by the foxes than was any other species of bird. The foxes capture many cock ptarmigan during the mating season.

After the young ptarmigan are out of the shell they are menaced by Black-billed Magpies as well as by the foxes. Thus on June 24 a family of four young and two adult magpies was found systematically working the willows in the Savage River bottom for ptarmigan chicks. When these magpies located a pair of adult ptarmigan they would retire stealthily and hide in the willows near by, until the ptarmigan chicks began to run about. Then the magpies swooped down and grabbed the chicks before they could hide, and then carried them off and ate them. A cock ptarmigan that I watched put one magpie to flight, but where there were six and in another case *nine* magpies working together against two adult ptarmigan the odds were overwhelming. As a result of this persecution by the magpies we found that by July 10 many families of young ptarmigan had been reduced to only one or two individuals. Gyrfalcons also levy continuous toll on ptarmigan; and since these large falcons are relatively numerous in the Mount McKinley district, the aggregate number of ptarmigan killed by them is considerable. It is thus easy to see why the hen ptarmigan lays from six to twelve eggs. If only one or two eggs were laid each season the species would soon become extinct.

Museum of Vertebrate Zoology, University of California, Berkeley, June 6, 1927.

OLD TIMES WITH THE BIRDS: AUTOBIOGRAPHICAL

WITH TWO PORTRAITS

By CHARLES HASKINS TOWNSEND

MY FIRST BOOK OF BIRDS, a happy discovery in our household library, was contained between the covers of a bulky report of the United States Department of Agriculture for the year 1856. It was a fifty-page chapter on *Birds Injurious to Agriculture* by Ezekiel Holmes, illustrated with thirty-two full-page woodcuts after Audubon. It supplied what I needed fairly well, the only other work in the house on natural history being J. G. Wood's *Bible Animals,* which unfortunately did not apply to my part of the world. When the old home was abandoned years later, I rescued this treasure of youth and had it bound, together with another chapter from the same ancient and battered report, almost as much prized, on the *Quadrupeds of Illinois* by Robert Kennicott, whose trail in northern Alaska I crossed years after.

Ornithologists would not now admit that some of the birds discussed by Ezekiel Holmes, such as kingbird, orchard oriole and rose-breasted grosbeak, are injurious to agriculture. They are, in fact, rather reluctant about admitting that any bird is very injurious. The Carolina "parakeet" was still common in Holmes' day and "exceedingly annoying to the farmers." I still have in my collection a fine skin of this now probably extinct bird, taken near Fort Myers in Florida in the early 'nineties. Inexpensive books on American natural history were not as available in the 'seventies as they became twenty years later. There was no public library within reach and no one noticed my needs.

Our books being largely theological, I naturally turned to Holmes, as my only authority, for enlightenment on the passenger pigeons, at the flights of which I greatly marvelled. The last large flight of these birds in our neighborhood, twenty-five miles east of Pittsburgh, occurred in the spring of 1875. There can be little doubt about the date, as I visited the Centennial Exposition not long after, where I saw mounted pigeons for the first time. The two events are closely connected in my memory. With a single-barreled muzzle-loader borrowed from a neighbor, I killed pigeons in the scattered oaks that crowned a hill half a mile from our country home. The older boys of the neighborhood got more than I did. Some of them with a raking shot along a dead limb got four or five at a single discharge. Their guns were also muzzle-loaders. The birds had been coming pretty steadily since morning, an occasional low-flying flock of two or three hundred lighting on the oaks, while the greater bands of pigeons flew considerably higher and made no stops so far as we could see. They may have alighted on the wooded tops of higher hills a couple of miles farther north.

Looking southward along the western slope of the Alleghanies where the view was unobstructed, we could see the birds coming in many long irregular "streaks"—not compact flocks—the most of which passed during the forenoon. The streaks or bands, mostly advancing end on, were broad and dense in some parts, narrow and almost broken in others, while the far ends in some of them were too distant to be made out clearly. The pigeons may have been coming across the mountains six or seven miles away, which here have a northeast and southwest trend; but this could not be determined. We had heard of a great pigeon roost in Cambria, one of the mountain counties to the eastward. I described these flight formations to L. A. Fuertes, who sketched them rather successfully in his picture of the passenger pigeons in Chapman's *Birds of Eastern North America,* but the perspective is not altogether satisfactory. I did not then know how to

skin birds. The pair of mounted passenger pigeons now in my possession, the gift of the late Frederic S. Whitman of Brooklyn, came from a roost at Grand Haven in Michigan in 1880.

At that time, so far as natural history was concerned, I travelled quite alone. Some lines written by the Selborne naturalist a hundred years earlier, applied well enough to my locality: "It has been my misfortune never to have had any neighbors whose studies have led them toward the pursuit of natural knowledge; so that, for want of a companion to quicken my industry and sharpen my attention, I have made but slender progress." Delightful and unconscious modesty! The literary world appraised his accomplishment quite otherwise.

They intended me for the clergy, to keep up family tradition; but I was too fully occupied with the natural world to consider the supernatural. A dentist in the neighborhood taught me what little he knew about mounting birds and I formed a small collection consisting chiefly of game birds. The specimens must have been presentable for they were purchased to adorn the rooms of a sportsman in an adjoining county and I was engaged to make additions. This important undertaking languished, as I was forced to attend country school and devote myself to arithmetic, grammar and other uninteresting matters. It was perhaps just as well, as my nucleus of a collection eventually went down the Conemaugh along with the most of Johnstown. About this time the *American Cyclopedia* in sixteen volumes came to our house. In this rich mine I dug out all the natural history nuggets from aard-vark to zebra.

Professor Henry A. Ward introduced me to the museum atmosphere in 1879, when he invited me to Rochester. There I got acquainted with F. A. Lucas and W. T. Hornaday, then in his employ. The three of us later found our several ways to the National Museum and eventually turned up in New York, each as the director of a museum in that city. We are still sitting on the lids of those institutions. Although on a commercial basis the collections at Ward's natural science establishment were varied and accessible, and there was a fair working library, in which I read industriously. Training in museum methods is one of the ways in which embryo naturalists get started on their careers. Some of the young men employed as preparateurs in osteology, taxidermy and other museum work, became college professors, explorers and museum curators. The late Professor W. B. Barrows who wrote much on the birds of Argentina and Michigan, was among the "alumni" of Ward's, as were also George K. Cherrie, Carl Akeley, Prof. Henry E. Crampton, of Columbia, Prof. W. M. Wheeler, of Harvard, and Prof. Ward's son Henry. At that time we were preparing collections for the Museum of Comparative Zoology on a large order from Alexander Agassiz, with whom I sailed later in the *Albatross*.

In 1882 they took me into the Philadelphia Academy of Natural Sciences on my own recognizance, plus a letter of recommendation from Professor Ward, where I dabbled in ornithology and other zoologies, with great personal satisfaction but to little scientific effect. It took me a long time to find myself, enjoying as I did, everything in nature from birds to pollywogs. The all-around naturalist misses in considerable degree the distinction that attaches to the work of the specialist.

While at the Academy I had some acquaintance with Edwin Sheppard, the artist, and the venerable Titian Peale. Sheppard, a tall distinguished looking man, was drawing birds on little blocks of wood for Dr. Coues, to be engraved by Nichols. I there saw many familiar bird cuts in the making. I recall his telling me one day that he was among those who surrendered to General Grant at Appomattox. His woodcuts do not appeal to bird men in these days of abundant photographs and colored plates, but they have a charm of their own. They are instantly recognizable portraits of the species

they represent. There is a delicate expression of light and shade, and the birds are properly balanced on their legs despite the fact that they were drawn from old museum specimens often indifferently mounted. Sheppard like many another bird artist had the habit of sketching in a background in which most of the distant landscape appears *below* the bird standing on the ground. It must be somewhat of an accomplishment to get a glimpse of the horizon between the legs of a wading bird. But I am not an artist. Gurdon Trumbull used nearly a hundred of Sheppard's birds as electrotypes in his *Names and Portraits of Birds*, and I was mightily pleased when W. L. McAtee reproduced fifty of these in a recent document of the Biological Survey. The camera has given us a new ornithology since Sheppard's day.

Mr. Peale kindly allowed me the use of his Audubon, a volume at a time, my first acquaintance with this work. Later, in the *Albatross* I sailed in Peale's wake in Polynesia, where he had collected and painted birds while with the Wilkes Expedition sixty years before. During that voyage we picked up four hundred birds of ninety-three species, on thirty-three different islands, many of them being new. They were reported upon by Alexander Wetmore and myself, Wetmore with his greater ornithological ability doing most of the work.[1] Peale's collection in the National Museum furnished most of the material for comparison. Some of the islands were then visited for the first time by naturalists.

At Whitsunday, an uninhabited atoll of the Low Archipelago, I shot a sandpiper of a species *(Aechmorhynchus parvirostris)* first taken and described by Peale, no other specimens being known. Conditions were unfavorable and my boat was the only one that succeeded in making a landing at this remote but famous atoll. The only other bird I secured there was a new warbler *(Conopoderas rava)*. Darwin saw this atoll from the deck of the Beagle but could not land. His picture of it is copied from Beechey's *Voyage*. My own, published by Agassiz, was taken from the top-sail yard of the *Albatross*. This was an oceanographic voyage in charge of Agassiz, and our stops were brief except at islands where supplies were renewed. The collecting of birds was largely dependent upon my personal efforts. The skinning had to be done at night after the ship's laboratory had been cleared of the day's deep-sea dredgings.

At Philadelphia, Spencer Trotter, W. E. Saunders and W. L. Baily were the only young men among my associates who made use of the Academy's large collection of birds. Baily one day brought in a hybrid sparrow *(Junco-Zonotrichia)* of which I prepared a description and E. T. Seton a colored plate for the *Auk*. Hybrids between distinct genera of sparrows are rarities and are interesting as throwing light on certain obscure species known only from single examples.

When I met Professor Baird, in 1883, he at once inquired as to my relationship with J. K. Townsend the ornithologist. All I could say was that we probably had the same Philadelphia quaker ancestor, mine having arrived there with William Penn in the ship *Welcome* in 1682. Prof. Baird gave me a job in the Fish Commission and within a week sent me to the salmon hatchery on McCloud River, California. Knowing that I was something of a collector, he wrote personal letters from time to time requesting that certain birds be secured. I collected about two hundred species there and around Mount Shasta before it was time to start back to Washington.[2] Professor Baird thought there was a chance of finding white-tailed ptarmigan on Shasta and I followed the timber-line clear around the mountain; and then I tried Lassen Peak

[1] Albatross Voyage. Tropical Pacific, 1899-1900. The Birds, by Charles Haskins Townsend and Alexander Wetmore. Bull. Mus. Comp. Zool., Harvard Coll., vol. LXIII, no. 4, 1919, pp. 151-225.

[2] Field-notes on the Mammals, Birds and Reptiles of Northern California, by Charles H. Townsend. Proc. U. S. Nat. Mus., X, 1887, pp. 159-241, pl. 5 (map), several text-figs.

awhile before giving up the search. Lassen became an active volcano thirty years later and deeply covered my old collecting ground with ashes. I joined a party of the U. S. Geological Survey for a few weeks that summer (1883) and participated, zoologically, in the survey of Mount Shasta.

Fish cultural duty in California was followed by a cruise with the *Albatross* among the Bahamas in 1886. Our capture of specimens of the long-missing Kirtland warbler and several new species in the Bahamas was a matter of great interest to Prof. Baird. Sir Henry Blake, the governor, came on board often while we were at Nassau, when I taught him to skin birds. This attractive and capable Englishman was afterwards governor of the British colonies of Jamaica, Newfoundland, Queensland, Hongkong and Ceylon. He facilitated my bird work in the Bahamas, and one of my new birds from Abaco was named *Centurus blakei*. According to our experience, England always had fine officials in her colonies.

Fig. 73. CHARLES HASKINS TOWNSEND IN 1883, AT TIME OF DEPARTURE FROM PHILADELPHIA FOR MCCLOUD RIVER FISH HATCHERY, NORTHERN CALIFORNIA.

In 1885, I accompanied the U. S. S. *Corwin* on a voyage to Kotzebue Sound and went with Lieutenant John Cassin Cantwell, a nephew of Cassin the ornithologist, on a two months' trip up the Kowak River. We were the first white men to reach its headwaters. It was a hard drive every day, and we often stood waist deep in the icy water getting our launch off the sand bars; but I managed to pick up fifty-two species of birds while above the Arctic Circle. The boreal species were to be expected, but to find such common home birds as robin, swallow, shrike, water-thrush, rusty blackbird, kingfisher and others, was to realize for the first time that birds do considerable moving about. During the trip Cantwell told me more or less about Cassin, but I have no notes on the subject. At the Pribilofs I got the Asiatic stint *(Tringa damacensis)* which was as far off its beat as the stray catbird I found at the Farallon Islands in 1894. Both records remain unique.

After that came a trip to Honduras in 1887 which yielded hundreds of birds and a dozen new species. Professor Baird gave me a letter to Mr. George N. Lawrence with whom I spent an evening before sailing from New York. A student of tropical birds, he talked about the birds I would likely find in Honduras.

This trip included visits to Grand Cayman and Swan islands in the Caribbean Sea. I am unable to recall anything in outpouring bird-song comparable with the early morning chorus of the mockingbirds *(Mimus orpheus)* at Grand Cayman. The continuous volume of melody came from every part of the surrounding shore of the little bay where

our schooner lay, as though each of the host of musicians was producing his entire repertory. It was the waking call for all on board. The only approach to it in my experience was the singing of the large babbling thrushes *(Conopoderas percernis)* of Nukuhiva, in the Marquesas. The woods rang with their melody and it was not uncommon to hear several of them singing on a single tree. They were by far the best choristers of Polynesia. Herman Melville, in "Typee", that classic of Polynesia, said the Nukuhiva birds were all songless. Being the captive of cannibals, he probably had more important matters on his mind than birds. Anyway he was wrong.

Swan Island was visited by a naturalist for the first time when I landed there. I collected thirty species of birds, certainly all that were present at that time.[3] Visiting Swan Island twenty-two years later, Percy R. Lowe[4], now of the British Museum, found some changes in the bird life. The black ani *(Crotophaga ani)* had established itself there, possibly from Grand Cayman, 185 miles distant; but he searched in vain for the red-legged thrush *(Mimocichla rubripes)* which was well represented in my collection.

To enter Honduras at the mouth of the Segovia River was to enter the tropical jungle for the first time and have acquaintance with toucans, trogons, scarlet macaws, brilliant tanagers and others of the feathered host of gorgeous attire. The first camp a few miles up the long river which separates Honduras from Nicaragua, was beside a tree in the open colonized by cheerful hang-nests *(Ostinops montezumae)*. A score of yard-long nests swung from the higher branches, suggesting at a distance strange fruits rather than the treetop cradles of young birds. My Indian canoe-men salvaged the bodies of the birds I skinned and put them in the pot along with that of a spider monkey. I did not always participate in their feasts; but sometimes there were delectable pigeons and river turtles, with occasional deer. Farther up and weeks later we entered an open pine forest where scarlet macaws gathered in the high trees like grackles at home. Following the river, the only thoroughfare far inland, with nature's bird and other riches abounding, the half-enchanted naturalist thinks little about turning back, and the enchantment lasts until he has drifted out again.

Professor Baird had arranged for the *Albatross* to go to the Pacific in the autumn of 1887 but did not live to see the vessel start. We got birds at many points around South America, especially in the Straits of Magellan[5] and at the Galapagos Islands. The latter collection supplied the material for Ridgway's *Birds of the Galapagos*, supplemented by another collection when I re-visited the islands on the *Albatross* voyage of of 1891.

In the Straits sea birds were constant objects of interest. The nesting places of cormorants were marked by masses of black-backed, white-breasted birds, acres in extent. From low island levels Cassin terns rose in clouds of protesting thousands when our boats grounded.

Steamer ducks kept well ahead of the active oarsmen, their flightless wings aiding their webbed feet in a manner suggestive of paddle wheels used as auxiliaries to screw propellers, trailing a foamy wake a hundred yards behind. The species belongs exclusively to southern South America and is altogether the most notable bird of the Straits region. It is said to weigh over fifteen pounds. While it can not, or at least does not, fly, and is seldom inclined to dive, the rapidity of its progress over the surface long ago attracted the attention of explorers and navigators. Most observers are of the opinion that the wings move alternately when in motion. An occasional penguin—that flight-

[3] Catalogue of a Collection of Birds made by Mr. Chas. H. Townsend on Islands in the Caribbean Sea and in Honduras. By Robert Ridgway. Proc. U. S. Nat. Mus., X, 1887, pp. 572-597.

[4] A Naturalist on Desert Islands. By Percy R. Lowe. Witherby & Co., London, 1911, 300 pp., 32 ills.

[5] A Naturalist in the Straits of Magellan. Charles Haskins Townsend. Popular Science Monthly, July, 1910, pp. 5-18, 9 ills.

less, burly diver peculiar to Antarctic seas—only showed himself above water in porpoise-like leaps and was seldom easy to get.

The diving petrel, also Antarctic in range, was by special request a mark for all guns, but no specimens were taken. As a quick diver it is a little brother to the northern auklet, which it resembles in appearance and to some extent in habits. When at large there is nothing in its actions to suggest the petrel. It strikes down into the water from full flight, emerging farther on, fairly bursting forth into the air with wings in rapid motion.

The barred Magellan geese are important on account of their abundance. This bird is a resident of the region throughout the year. It is an inhabitant of the open plains and mountain slopes and is a land rather than a water species. It occupies the open country of Tierra del Fuego in enormous numbers and has contributed more to the food of the white settlers now establishing sheep ranches in that country and in Patagonia than any other wild creature. The most familiar bird of the Straits is a species of creeper which follows the hunter constantly through the forest. The Cape Horn wren is as saucy as a wren can be, and the marsh wren creeping through the grass like a mouse, is almost familiar enough to be caught with a butterfly net. Of the hundred or more species of birds to be found along the Straits we obtained about seventy, three of which belonging to the family of "wood-hewers" were new to science. Our bird collection numbered one hundred and seventy specimens in all.

We are indebted to Darwin for the first accounts of the peculiar land birds of the Galapagos, "the importance of which in their bearing upon the study of natural science has never been equalled" (Salvin). Habel collected there in 1868, and two smaller collections were made later by others.

After running a line of deepsea soundings from Panama, the *Albatross* turned us loose on these classic islands for eleven arduous but wonderful days. There was help in the collecting, but I worked until midnight at the preparation of bird skins, leaving to others the preservation of reptiles and such miscellaneous zoological plunder as each returning boat dumped into our upper and 'tween-decks laboratories. Everybody was drafted including the surgeon, who helped to press plants, while boat crews swept the beaches with seines. There were eighteen tortoises crawling about the deck when we sailed, one of them big enough for the sailors to ride. The giant land tortoises for which the archipelago was named, had already disappeared from some of the islands and were scarce on the others. Ships had been carrying them away in large numbers for three centuries. I once made a study of whale-ship log-books to ascertain what the whalers of the nineteenth century did to the tortoises and found that seventy-nine ships carried away thirteen thousand tortoises.*

Half of the land birds are finches. In the peculiar Geospiza finches of the Galapagos, of which Ridgway recognizes as many as twenty-two species, all the males are black. In a few species the bill is thicker and heavier than in any other members of the Fringillidae, while in most of them it varies amazingly in size and form.

We did not collect many water birds, believing that our limited time should be spent on the indigenous land birds. In this way we missed a prize—the short-winged and absolutely flightless cormorant which remained unknown until 1898. Another water bird of unusual interest because of its geographical position on the Equator, but which we did not overlook, is the Galapagos penguin. I have living specimens in the Aquarium that are as lively and engaging as any birds could be. I often lift them out of their pool, to follow me about the floor.

* The Galapagos Tortoises in Relation to the Whaling Industry. Charles Haskins Townsend. Zoologica, N. Y. Zool. Soc., IV, 1925, pp. 55-135, 11 pls., map.

Investigations in the North Pacific kept the ship busy for several years. We surveyed the fishing grounds along the northwest coast and in Bering Sea; sounded the route for the Hawaiian cable; mapped the seal rookeries of the Pribilof and Commander islands; participated in the Bering Sea patrol and charted part of the Aleutian region. I sent many birds to Washington after these voyages, all secured at random as opportunity afforded. This was entirely unauthorized work by a young man supposed to be fully occupied with fishery and other investigations. During this northern work we had our prolonged controversy with England over "The Bering Sea Question". "Pelagic sealing" and "seal rookeries" became household words. The *Albatross* staff had to study fur seals ashore and afloat and supplied much of the matter that filled volumes of public documents on both sides of the Atlantic. I never stopped the voluntary picking up of birds when the *Albatross* visited out-of-the-way places. While the detailed instructions sent to the ship before each voyage might cover a wide field of fishery and oceanographic investigations, ornithology was not included. Mr. Ridgway, however, never failed to send me a list of desiderata, and when I had a run ashore in the Fijis, or anywhere else, it was invariably with a gun and a fishing creel for birds. According to engine-room records, the *Albatross* steamed over 200,000 miles while I was with her and the birds sent to Washington numbered among the thousands. When the ship was sounding or dredging in deep water I often lowered a boat and shot petrels, but we never got the long-missing Hornby petrel, of which Mr. Ridgway sent me a colored sketch that hung in the ship's laboratory for years. Later on, Chapman found the Hornby Petrel common on the coast of Ecuador. The second and third specimens of the Least Petrel which had been missing for a quarter of a century obligingly flew aboard the ship, one in Panama Bay, the other off Acapulco. An electrically lighted ship is a good target for night-flying petrels. I have captured twenty in a single night. We got many petrels also when the ship was under way by trailing a long cod line astern, from which were suspended numerous threads with small fish hooks attached. The petrels swinging from side to side in the ship's wake often got their wings hooked, then the cod line would be hauled in.

The new species of birds were generally described by somebody before I got a chance to visit headquarters; but I succeeded in attaching my name to a dozen or more by sidetracking some bird collections at San Francisco and taking them to Washington later on as personal baggage. It isn't safe to leave undescribed species where ornithological nomenclators are prowling about. Mr. Elliot, for instance, found some novelties in my collection of Aleutian ptarmigan; but I had at least the fun of shooting them on the mossy mountains of Attu, Aggatu, Kyska and Adak, to say nothing of Atka and Unalaska. And what joy for my setter, who was a sailor for years!

At Cocos Island, Professor Agassiz, then in charge of the *Albatross*, gave me a whole day ashore, which was productive of bird rarities.[6] Cocos Island, visited many times by seekers for buccanneers' treasure, had been visited only once before by naturalists when H. M. S. *Sulphur* called there in 1840 and found a peculiar cuckoo *(Coccyzus ferrugineus)*. I secured two more specimens of this rarity, a new genus and species of flycatcher *(Nesotriccus ridgwayi)* and specimens of *Pinaroloxias inornata*, a small finch-like bird, previously known from a single specimen and wrongly attributed to the Low Archipelago. Cocos is small, high, well wooded and has some small streams. If I had to be marooned on a small uninhabited island I think I'd select Cocos.

Malpelo lies to the southeast of Cocos on the Panama-Galapagos course. I lowered a boat and tried in vain to find a foothold at the northern end. This apparently inac-

[6] Birds from Cocos and Malpelo Islands, with Notes on Petrels Obtained at Sea. By C. H. Townsend. Bull. Mus. Comp. Zool., XXVII, No. 3, 1895, pp. 121-126, 2 pls.

cessible rock is a mile long and nearly a thousand feet high, its top a guano-whitened bird rookery. I did not try the other end where the sea was making a turmoil. I shot four fork-tailed gulls *(Creagrus furcatus)* from the boat and saw others on the cliffs. This was a new locality for *Creagrus*. Only three specimens of this bird were known prior to the voyage of the *Albatross* to the Galapagos in 1888, when I shot two at Dalrymple Rock off Chatham Island.

Fig. 74. Doctor Charles Haskins Townsend in 1926, when Director of the New York Aquarium.

The *Albatross* once dropped anchor at the Revilla Gigedo Islands, 100 miles southwest of Lower California. While the seining crews were sweeping the beaches for fishes I had a profitable day ashore with the birds. The results were five new species, a burrowing owl, a dove, a wren, and two petrels. Twenty of the petrels came on board at night, six of which were skinned. This was the first visit of a naturalist to

Clarion and San Benedicte, the other island, Socorro, having been visited by Grayson twenty years before when several new land birds were found. The islands off southern California similarly rewarded my bird collecting efforts.[7]

After a time it fell to my lot to direct the work of the ship. During investigations in the Lower California region, when there were in the ship's company efficient helpers in the labor of bird skinning, we got 800 birds of 159 species from the Peninsula and from islands in the Gulf.[8] A dozen species came from Tiburon Island, the first and, so far, the only birds known from that large unexplored island.

I think I never saw a single species of sea bird in greater numbers within a limited area, than when the *Albatross* entered Yukon Harbor in the Shumagin Islands; everyone on board noticed the increasing numbers of crested auklets as we passed in.[9] The surface of the water was covered and the air filled with them. This lonely and uninhabited anchorage was apparently occupied by crested auklets to the practical exclusion of other birds. Large flocks launched themselves into the air from the lofty cliffs and careened toward the vessel with great speed and loud whirring of wings. During the long evening the birds were amazingly active. We tried the effect of a long blast of the whistle. The result was startling: bird legions shot out from the cliffs to join the amazing numbers already in the air and on the water. It was a surprising and memorable ornithological display, even to those of us who had seen the almost unbelievable numbers of murres that revolve, like the rings of Saturn, about St. George Island at the Pribilofs.

Other memorable aggregations of birds were provided by the sooty shearwaters that sometimes gather at sea in vast numbers both north and south of the Aleutian islands. We saw at least one of these great congregations every summer, but one seen southwest of the Shumagin Islands surpassed all our previous experiences with them. To discuss their numbers in commonplace terms of millions would not convey the impression made upon us at the time. The birds were no more to be numbered than "the innumerable company of the stars". The sea was smooth and the *Albatross* was making about eight knots through the bird-covered area, which extended as far on both sides as it was possible to see from the top-sail yard. It was "Alaska weather"—inclined to be hazy and the horizon not very clear. Immediately ahead the birds kept rising and moving out of the ship's course. The rather narrow belts that were disturbed on either side rose and moved forward, joining the continuous flight of those ahead, which gradually tended to windward toward the left. The log of the *Albatross* might show how long we were crossing the avian galaxy. It would be worth looking up.

It was not my destiny to go very deeply into ornithology. The long voyages with Agassiz, always illuminated with his enthusiastic talk in the ship's laboratory, amounted to a course in oceanography, which tended away from ornithology and eventually anchored me at the Aquarium. In this fishy atmosphere only the sea birds, pelicans, boobies, gulls, gannets and Galapagos penguins remain.

The New York Aquarium, New York City, May 17, 1927.

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[7] Birds from the Coasts of Western North America and Adjacent Islands, Collected in 1888-'89, with Descriptions of New Species. By Chas. H. Townsend. Proc. U. S. Nat. Mus., XIII, 1890, pp. 131-142.

[8] Albatross Voyage, Gulf of California. Birds Collected in Lower California. By Charles Haskins Townsend. Bull. Amer. Mus. Nat. Hist., XLVIII, 1923, pp. 1-26, 1 pl., map.

[9] The Crested Auklet, by Chas. Haskins Townsend. Educational Leaflet, no. 65, Nat. Assoc. Audubon Soc., 1913.

STRANGE FEATURES IN BIRD HABITS

By FRANK A. LEACH

I HOPE it may be found excusable, in the introduction of this subject, for me first to express regret and some disappointment that none of our students and observers of habits of the birds of California have yet found sufficient interest in the life of the California Woodpecker to discuss or question the remarkable communal habits attributed to this highly interesting bird, in a contribution appearing in the CONDOR of January, 1925. The facts set forth in that article were so inconsistent with the known habits of bird kind in general that no doubt they were commonly regarded as being inaccurate, or a misinterpretation of actions of the birds, or at least of questionable character. I know that something like this must have been the point of view of an editor of a prominent eastern publication to whom the description was first sent, for he said he would hold it for use upon receipt from me of supporting evidence.

The article did not assume a discovery establishing the peculiarities as being customs of the species as a whole, but simply as the conduct of a particular colony of eight or ten woodpeckers that habitually made their headquarters in a certain cluster of valley oak trees. I remarked, however, that the strange habits might be found to be common with the species, as I had noted some features of the same conduct in the nesting activities of another colony located in a cluster of oaks a few hundred yards distant from the first mentioned. Beyond the statement of Mr. Joseph Dixon to the writer, that he had noticed some of the mentioned peculiarities among woodpeckers inhabitating the Sacramento Valley, and the reference in Mrs. Myers' bird book to other than parent birds aiding in feeding woodpecker nestlings, I have read or heard nothing from any authority on the habits of birds alluding to the subject.

It would seem that the evidence so far presented warrants investigation by skilled observers, to determine whether or not the California Woodpecker follows habits in nesting so greatly at variance with the behavior of other bird species. Obviously, if it should be found true, the fact is worthy of place in our bird histories, to say nothing of the interest from a biological point of view.

For the benefit of those who may not have read the publication referred to, and as well as to attempt some justification of my criticism, perhaps it would be well here to describe briefly the principal features of what has been referred to as "strange conduct." In doing so, let it be borne in mind that the description refers to the acts of a certain lot of eight or ten California Woodpeckers *(Balanosphyra formicivora bairdi)* that seemed to form a colony. That they formed a colony was suggested by their acts in making a certain oak tree their headquarters; and while they apparently dwelt in harmonious relations among themselves, the presence of a woodpecker from other sections of the Park was regarded as trespass and this bird at once became the object of attack. Besides, the idea was strengthened by their conduct in the breeding period.

My attention was first called to these birds in the early part of 1921 when I found them excavating a hole on the westerly side of a telephone or trolley pole situated near the oak tree mentioned. A heavy storm in March caused them to stop their work and abandon further operations in the undertaking. On February 2 of the following year the birds were discovered in a renewed attempt to excavate a nesting place in this pole. This time the entrance hole was started on the northeasterly side, where it would be least liable to be flooded by rain.

In watching their operations it was soon discovered that more than a single pair of birds were giving their time and labor to the work. It appeared as if each member of the colony took a turn at the job. There were at all times two to four birds perched on the cross arm or wires near by, ready to drop down and relieve the working bird when their turn came. Thus the excavation was continuously and most industriously carried on from early morning until dark, with but little interruption, until about the first of April. The cavity for nesting purposes was so enlarged by the month of March, or the latter part of it, that two or more birds were frequently working inside at the same time. By April 1 the birds began to show more interest in mating affairs than in construction of the nest.

In the incubation period it appeared as if the duty of covering the eggs was divided among the members of the colony, operating in relays devoting from five to ten minutes each. I say "appeared", for it could not be seen what was taking place in the nest, but the idea was suggested by the continued going in and coming out of the nest by the different birds of the colony, a proceeding that lasted during all the daylight hours. In all probability the thought would not have occurred were it not for the cummunal actions displayed in other features of the general proceedings. When the young birds were hatched a most lively interest was manifested by the members of the colony. The frequent arrival at the nest of two or more birds with food, sometimes three and again as many as four, indicated that a goodly portion of the colony, if not all, participated in the needs and care of the youngsters.

The paper previously mentioned detailing the above stated facts was not given publication until observations had been noted on the production of three broods of young in the pole nest in 1922 and the same number in 1923, and in 1924 after the colony was forced to nest in the big oak tree by the destruction of the trolley-pole; and, moreover, after witnessing similar conduct by another colony a quarter of a mile away. So it must appear that conclusions as to facts, or errors of interpretation, if errors there be, were not matters of hasty decision, but reached after devotion of many days and hours of close observation to the conduct and habits of the woodpeckers.

Another common bird that has always claimed my interest is the jay. In speaking thus I make no distinction between the two species familiar to Californians. These birds are common in numbers and are uncommonly endowed with intelligence, activity in life, and possibly mischievous habits. In these matters there are no differences between the two species, even though in appearance they are quite unlike. Their habits of misbehavior are of such conspicuous character that they bear a bad reputation among most people, and, what is more, the birds are outlawed by legislative action of the state. It is possible that their unpopularity would be modified if the public could be made better acquainted with all of their habits, and with the good that comes from their appetite for many forms of insect life.

I confess that a number of years ago I shared, to some extent at least, the feelings of popular enmity. I was completely won over, however, to the opposite way of regarding the birds, after watching a pair of the California Jays *(Aphelocoma californica)* and their offspring during the length of a brooding season. Whether at work or otherwise engaged, the birds always displayed a wonderful degree of active intelligence. While commonly expressing their emotions in loud and rather harsh voices, I was astounded when I discovered their capability to produce some of the sweetest and softest warblings of bird music. It was never given in vibrant tones, but in low soft notes, scarcely audible beyond a hundred feet or less, as if the birds were indulging in private rehearsal. Again, I detected them in what I thought were attempts at mimicry of notes of other birds. The crested jay of the mountains, cousin of the California Jay, imitates

the screech of the Red-tailed Hawk so perfectly as to be indistinguishable from the genuine cry; so it would not be surprising to find the habit of mimicry in other branches of this family.

In conclusion I will relate a little incident of recent occurrence in Oakland, observed by a friend, which illustrates the unusual wisdom of the jay. This friend maintains a feeding table for the birds that inhabit the grounds about his home. Last Christmas morning he put some pieces of bread crust on the table. Soon after, he saw a jay take one of the pieces of crust to the ground and thrust it into the soft dirt, then take a leaf and lay it over the buried morsel. This done, the bird repeated the act in all its details. Thereupon my friend called his brother, relating what he had witnessed, and while the two stood there watching proceedings the jay twice repeated the act of burying the bread and covering the place with a leaf, making four caches altogether. The burial alone of the bread crusts might not be considered so very remarkable, but the attempt to conceal the places by covering them with leaves indicates an unexpected degree of cunning.

Probably this is as rare in the habits of the California Jay as was the action of a male quail in an incident that came under the observation of a friend living in the country near Lafayette, Contra Costa County. A common hen stole away from the chicken house and hatched a brood of chicks, to return later to the vicinity of the house proudly piloting a dozen or so of little ones. The members of my friend's household were astonished to discover that the brood was accompanied by a male Valley Quail, and that he was manifesting all the care and interest of a parent in the welfare of the chicks. This was not an affair of the moment, or of passing attraction for the quail. On the contrary, he had attached himself to the group as if inspired by some instinctive sense of obligation to share with the mother hen all the duties of rearing the family, a feeling that never weakened or abated from the date of hatching until the chicks reached the stage when they no longer needed the mother hen's care. During all this time he manifested in various ways his devotion to the task he had assumed. When first seen he was scratching the ground in regular chicken fashion, with several chicks hovering around ready to receive each morsel of food he uncovered. As may be imagined, this was one of the most entertaining features of the strange combination. He was ever alert for the approach of enemies, such as a hawk, dog, or cat, in the vicinity. On such occasions this quail would take a position on top of a post or other place of vantage, sounding the peculiar quail notes of alarm or warning of approach of danger.

As notes of warning and cries of distress, though much different in quality with each species, have such likeness in expression or accent, their meaning seems to have universal understanding among all bird kind, and it was not strange that the young chicks should respond to the foreign language of the foster father by hastily seeking places of safety with the mother hen. This strange alliance of a wild quail with domestic chickens was a feature of great interest, which my friend took pleasure in exhibiting to visitors to his country home, and therefore there were numerous witnesses to the incident.

In accounting for the conduct of the quail my friend suggested a very reasonable theory, which was, that probably it and its mate had had a nest in the vicinity of the spot chosen by the hen, the hatching in both taking place at about the same time, when the mother quail and her chicks became the victims of some predatory animal or bird. Thereupon, the father quail found in the domestic chicks a brood of youngsters quite similar in every way, except as to size, to his own brood, minus the protective and assisting services of a male parent, and he immediately filled the vacancy, probably instinctively directed to this action by the loss of his own family.

There are certain actions of birds, also noticeable in some other forms of the animal kingdom, that have caused me to wonder if nature had not given birds and other ani-

mals a sense of perception in locating food far beyond anything of the kind possessed by man. The details of two cases are set forth in the following paragraphs.

One spring-time I planted some peas in my garden. Noting that none "came up" upon the expiration of the usual time necessary for the sprouting of the seed, I made several excavations, to uncover them and to discover if possible the cause of the delay; the fact was disclosed that not a single seed remained where I had planted the lot. The flitting of a pair of California Towhees through some nearby shrubbery at once suggested a possible agency for the disappearance of the planting. With little hope of producing a crop, but with greater desire of discovering the actual facts relative to the mysterious disappearance of the seed, I concluded to plant another lot.

Preparatory to this, the ground was thoroughly pulverized so that the surface would be sufficiently smooth to record the tracks of animals, whatever ones should prove to be the culprits. Then I planted the peas about a foot apart in rows, putting 3 or 4 seed in each spacing or "hill". Special care was taken that no stray seed was left on the surface to advertise the planting beneath to any bird or animal scouting for food in that district. When the job was finished there were three rows, about 18 inches apart, twenty feet in length. I watched the place quite closely for a couple of days, but nothing happened. About a week later, however, I discovered the towhees there industriously scratching in the bed in a manner indicating that they were excavating and appropriating the planted pea seed. The behavior of the birds caused me to make an examination of the bed, when I found that it had again been robbed of the planting. Not a single seed had been overlooked by the robbers.

The surprising feature of the case was that the thieves knew exactly where each pea seed lay hidden beneath the surface of the ground. Apparently their knowledge was as accurate as if they had watched the planting and had staked out each hill, for there had been no experimental excavations made in hunting for the seed. The undisturbed condition of the surface of the ground in all parts except at the exact spots where the seeds had been planted affirmed that much. No mistakes had been made in locating the booty, and it had been as completely removed as before. This fact was made evident by the presence of empty little pits or holes as regularly spaced as the spacing of a checker board. It would have been impossible for a man possessed with the knowledge of how the peas had been planted to have removed the seed, with the neatness and without some error in location, comparable with the work of the robbers. The birds were possessed with such superior faculty or discriminating sense in locating the food that the operation bore the appearance of a Houdini performance.

While such behavior in birds is astonishing, perhaps an explanation can be found without resort to the unknown, or crediting the feathered family with mysterious powers of discernment. We all are cognizant of the fact that skill is the result of practice, and that wonderful accomplishments come through long and constant repetition of some particular act, and this within the lifetime of the performer. With this thought in mind it does not seem so strange that the capacity of all forms of wild life to obtain food should be raised in many instances to high degree, with performances appearing miraculous. Take the case of the towhee: As it and its ancestors have devoted about all the daylight hours of their existence to locating food, should we not expect the senses of touch, smell, hearing and sight, to be of extraordinary character? We have common evidence of the vast superiority of the eyesight of some species of birds over that of man. I have in mind the bluebird, as an example, that, perched high on a telegraph wire quickly detects the movement of a small insect on the ground, thirty to forty feet distant; and the flycatcher, darting into midair from some point of advantage and seizing a wandering object so small and distant as to be invisible to the ordinary observer; and the woodpecker, springing into the air and "looping the loop" seemingly for

no purpose, until the snap of the bill is heard. Then again, we have frequent exhibitions of the wonderful power of discernment of food possessed by robins. You see them scattered about on lawns or other grass plots endeavoring to satisfy a ceaseless appetite with angle worms. A robin suddenly pauses in its search, for a moment it is like a fixture, then in a flash its bill is thrust into the earth, seizing a worm. You know from the tugging of the bird and the stretching of the worm that the victim was buried beneath the surface. But here we may have an exhibition of superior keenness in some of the other senses in addition to sight.

I have a feed table for birds in front of a window of my apartment at Diablo, a source of never-ending interest in the study of bird behavior. This table is no more than the roof of a very wide and long porch, a place in itself that has no attraction for birds. Producing no food, and barren of retreat, a bird was seldom ever seen upon this roof until I began to place seed there. When I threw out the first lot I wondered how long it would take the birds to discover the bounty placed so far from where they were commonly seen. To my great surprise, in less than fifteen minutes there were several House Finches partaking of the feast, twittering soft notes of satisfaction as well as some louder notes sounding like calls to absent mates. Before the supply of seed was exhausted several Golden-crowned Sparrows, a couple of titmouses and a pair of California Towhees came and partook of the feast. In all there were fifteen or twenty birds feeding at the table. The most interesting feature of the incident was the celerity with which the visitors responded to the display of a "free lunch" located in such an out-of-the-way place. If some of these birds had been seen frequenting the porch roof in times prior to placing the seed there, I probably would not have noticed their quick response. However, under the circumstances, and considering the fact that the Golden-crowned Sparrows were ground feeding birds, I was impressed with this exhibition of power of discernment that seemed extraordinary to say the least.

For months following I gave the matter considerable attention, making experiments in the hours and regularity in days of feeding. During the periods when the birds were fed daily, their response was almost instantaneous; but when I omitted feeding them for three or four days, it required from one to five minutes for them to discover the seed upon renewal of the lunches. No particular species of my visitors appeared to possess superiority in detecting the presence of the food, for the first birds in doing this were sometimes the titmouses and at other times the sparrows, finches or towhees.

The birds mentioned were the regular patrons. They never missed a meal. Representatives of other species were occasionally seen at the table, among which were quail, juncos, San Francisco Towhees and goldfinches. With the exception of the quail these strangers to the immediate vicinity gave no indication that the discovery of the food supply was of any special advantage to them. Their visits were irregular and such as might have been incidental to their being in the neighborhood at the time of putting out the food. Still there remains to be explained how they came to discover the food even on such occasions.

A year or more has now passed since I established the free lunch for the birds, and I must confess I am not much nearer in arriving at a fully satisfactory theory as to the operations of the senses or instincts of the birds that direct them with such precision and promptness to this out-of-the-way feed table, than when the thought first occurred to me. Unfortunately, from my place of observation, vision is so interfered with, that the approach of the birds in response to the putting out of the food, is almost impossible to determine beyond 25 or 30 feet. But from conditions on the ground below, where is wide pavement, cement walk, and the main entrance to the building, it follows that the common habitat of the birds could be no nearer than the lawn and gardens beyond. The attendance at meal time as a rule began with the approach of one or two birds, to be

quickly followed by fifteen or more, coming from different directions. The majority seemingly flew up from the garden, but others came flying in at some elevation above the level of the porch roof, indicating that they came from a greater distance.

On one occasion, after an absence of four or five days, during which time the birds had not been fed, I made a careful survey of the surroundings and was unable to detect the presence of a single bird of the species that patronized the feed table. Upon throwing out the first handful of seed, a House Finch flew to the table from the top branches of an oak tree thirty or forty yards away. It was almost instantly followed by two or three more birds, and these in turn by increasing numbers until the usual gathering on such occasions was complete. This was accomplished in a few moments time.

The actions of the birds as detailed in this incident suggested the possibility that the finch in the tree top discerned the food supply, and by its manner of going to it revealed the placing of the bounty to nearby birds, and they in turn, likewise, relayed the information to the balance of the patrons. However, even in accepting this simple theory we are compelled to credit the birds with endowment of an eye-sight that is marvelous in its scope and power, which I think students of bird conduct can do with unanimity. But must we not also have to concede a mental activity beyond the realm of ordinary instinct, in the discernment by one bird of the purpose and intention of another by its actions in flight? Here, I fear, we find an obstacle to further unanimity of thought or opinion.

It is such cases as this and many similar ones that compel the thought that we have yet much to learn before the problem is solved.

Diablo, California, May 16, 1927.

THE BIRD LIFE OF SAN IGNACIO AND POND LAGOONS ON THE WESTERN COAST OF LOWER CALIFORNIA

By LAURENCE M. HUEY

SITUATED at intervals along the Pacific Coast, between Point Firmin in southern California and Cape San Lucas, which is the extreme southern end of the Lower California peninsula, are many salt water lagoons or estuaries. These tidal "esteros" range in size from mere cañon mouths, that flood with the high tides, to great bays many square miles in area and with water of considerable depth. Commencing at the north, these lagoons may be considered in six groups: (1) Point Firmin, which includes the San Pedro, Long Beach and Newport lagoons; (2) San Diego, which includes Mission and San Diego bays; (3) San Quintin, which includes San Quintin Bay and surrounding salt flats; (4) Northern Vizcaino Desert, which includes Manuela, Black Warrior and Scammon lagoons; (5) Southern Vizcaino Desert, which includes Pond, Coyote and San Ignacio lagoons; and (6) Magdalena, which includes the huge Magdalena Bay, with its many long inlets.

There is more or less literature on the bird life of lagoons in all these groups with the exception of that listed above as number five. The writer was therefore particularly fortunate in having opportunity, as the guest of Captain O. M. Seely, of the fishing boat "Nuchum", to visit both San Ignacio and Pond lagoons during April, 1927. The itinerary was necessarily governed by the prime object of the cruise, namely the securing of fish (mullet and sea trout), a task in which the writer rendered such manual assistance as he was able. Under Captain Seely's direction, the "Nuchum" passed the entrance to Pond Lagoon on April 10 and arrived in San Ignacio Lagoon at noon on April 11. The following afternoon it went back to Pond Lagoon, which was entered at daybreak on April 13. The boat remained in Pond Lagoon until the early morning of April 17, when it returned once more to San Ignacio Lagoon. Most of April 17, and all of April 18, were spent here, the 500-mile return trip to San Diego being started at 8 a. m. on April 19.

In addition to Captain Seely and his crew of two, the party included, beside the writer, E. E. Sechrist and Paul Bussey, who were commissioned to secure eggs and bird specimens for the private collection of Griffing Bancroft, a member of the San Diego Society of Natural History. These two spent their whole time at San Ignacio Lagoon, camping there while the others made the trip to Pond Lagoon. In the belief that no ornithologist had previously entered these lagoons, the writer kept daily field notes in especial detail, upon which the present paper is based.

In physical character, all six groups of lagoons listed in the first paragraph share two features in common, namely that no permanent flow of fresh water enters from the inland mountains, and that each, on the ocean side, has a great protecting sand spit thrown up by wind and wave action. The marsh floras of the four northernmost groups are almost identical, probably due to the fact that the same great oceanic current washes the entire shore line in which they are situated. However, by the time one reaches the fifth or Southern Vizcaino Desert region, the influence of coolness changes to one of semi-tropical character. The water is warmer and, at the season of the writer's visit, was peculiarly clouded, so that it was impossible to see even a few feet beneath the surface. The kelp, so familiar along our northern shores, is found to have disappeared, and with it, according to Captain Seely, the range of the crawfish *(Panulirus inter-*

ruptus) comes to an end. Replacing most of the low-growing *Salicornia,* great tangles of impenetrable mangroves *(Rhizophora mangle)* line the sloughs of the lagoons, in which the avian life elsewhere associated with mangroves is found.

The three lagoons in the group under discussion are in the vicinity of the large, semicircular Ballenas Bay, which lies at about latitude 26° north and longitude 113° west. San Ignacio Lagoon is at the eastern end of the bay, and the entrance to Pond Lagoon is about 40 miles to the west. Coyote Lagoon, which was not visited, lies between them. As the writer found the two lagoons which he entered to differ somewhat in avifauna and as they were vastly different in area, he will describe them separately.

SAN IGNACIO LAGOON

This lagoon is the most accessible of the three lagoons in this group. A channel of fair depth marks the entrance, but during stormy periods, when strong westerly winds blow, huge breakers pile up on the bar which are not always safe to navigate. Even during calm weather, crossing this bar has its thrills, and the writer experienced a decided chill down his spine as he watched a huge, foam-crested breaker racing up on the stern of the speeding boat that carried him across.

This was on the morning of April 11, 1927. The first ornithological observation made disclosed the presence of numbers of Royal Terns *(Thalasseus maximus)*, California Brown Pelicans *(Pelecanus occidentalis californicus)*, and Black-vented Shearwaters *(Puffinus opisthomelas)* feeding just outside the breakers as we crossed the bar. As the anchor was being lowered, just within the protection of the lagoon, a lone Glaucous-winged Gull *(Larus glaucescens)* circled near the boat.

Once over the bar, one is impressed by the great area of this lagoon. A long arm of water, 3 to 5 fathoms deep, extends about 25 miles inland in a northeasterly direction. The town of San Ignacio lies not a great distance from the headwaters of this arm. Well up this inlet are found two low, flat, barren islets, each about half a mile in length, known as "Whale Islands." They were visited for a couple of hours on April 12.

On landing upon them, a dozen Ruddy Turnstones *(Arenaria interpres morinella)* were found feeding with a small mixed flock of Western Willets *(Catoptrophorus semipalmatus inornatus)*, Red-backed Sandpipers *(Pelidna alpina sakhalina)* and American Black-bellied Plovers *(Squatarola squatarola cynosurae)*. Several small "cardons" or giant cactuses *(Pachycereus)* were growing on the islands and were well scarred with woodpecker work, but no inhabited holes could be found. A few large "frutilla" *(Lycium)* bushes were inhabited by a single pair of extremely timid Western Mockingbirds *(Mimus polyglottos leucopterus)* and a lone Shrike *(Lanius ludovicianus nelsoni)*, which was as wild as a shrike could be. On the open ground, a few scattered pairs of Horned Larks *(Otocoris alpestris enertera)* were present. In the shallow water near the shore of the islands, a single female Bufflehead Duck *(Charitonetta albeola)* was swimming and Red-breasted Mergansers *(Mergus serrator)* were fairly common. The latter were paired off in preparation for their northern flight soon to take place. A lone California Gull *(Larus californicus)* was seen, and a lone Coues Caspian Tern *(Hydroprogne caspia imperator)* was collected, which proved to be the only one observed in this lagoon.

By far the most interesting part of San Ignacio Lagoon, however, is another inlet that runs to the eastward. This arm is not so long nor so large as the one that extends toward the northeast; and its shores, with their many sloughs, are heavily overgrown with mangroves. This feature stood out in marked contrast with the barren shores of the larger, northeastern arm. A study of the region revealed the fact that the mangroves were to be found only where fresh sea water was carried by the daily tides.

This dense growth gives unlimited protection to bird life, and the majority of the avian population was found to be in this part of the lagoon.

We spent part of April 11 and all of April 18 amid the sloughs in this section. Several species of the heron family were seen in the mangroves. American Egrets *(Casmerodius egretta),* Lower California Reddish Egrets *(Dichromanassa rufescens dickeyi),* and Brewster Snowy Herons *(Egretta thula brewsteri)* were represented, but not in large numbers. Black-crowned Night Herons *(Nycticorax nycticorax naevius)* and Bancroft Yellow-crowned Night Herons *(Nyctanassa violacea bancrofti)* seemed to be located in small colony groups in preparation for the nesting season. A careful search by the writer of a "colony" from which about 30 pairs of these two species (mostly Black-crowned) had been flushed, failed to reveal anything but half a dozen old nests amid the mangroves.

Frazar Green Herons *(Butorides virescens frazari)* were located in pairs about the small sloughs that twisted in and out through the mangrove swamps. When flushed they did not fly far, but sought a nearby perch, usually on the top of a mangrove, where they resented the intrusion upon their domain by spreading up their neck and crest feathers and uttering a number of very discordant, hoarse croaks. No evidence of nesting was found at the time of our visit, nor was there any indication of nesting activities soon to take place when the specimens collected were dissected.

Mangrove Warblers *(Dendroica bryanti castaneiceps)* were likewise found in isolated pairs and gave evidence of early nesting by their singing and by the condition of the sex organs of the specimens collected. This warbler was one of the most interesting species observed. The song of the male was usually delivered from a hidden position amid the dense mangroves, though occasionally the bird was seen perched on a dry twig projecting above the level tops of the thicket. The song was pleasing in tone, and of good volume, suggesting that of the Yellow Warbler, but less shrill. Unlike the song of the Yellow Warbler, it was given with a steady rising inflection. The alarm note is a sharp chirp, audible at some distance even during a brisk wind. This note is uttered at intervals and always in the same tone, much as are the chipping notes of the Orange-crowned Warblers. In searching for food, Mangrove Warblers resemble others of the genus *Dendroica* in their habit of searching each leaf and stem with the most careful scrutiny. At times, however, they were seen to launch forth into the air, in true "flycatcher" fashion, after small insects. These aerial sallies were seldom for a distance of over 10 feet, and the bird nearly always returned to the same perch from which it started.

Growing like green glades among the mangroves, over the wetter portions of the marshy area, a species of cord grass *(Spartina)* was found. This plant is not uncommon in all our coastal salt marshes, and in San Ignacio, as elsewhere, was found to be always in the wash of the tides. Through this growth, Abreojos Large-billed Marsh Sparrows *(Passerculus rostratus halophilus)* and Belding Rails *(Rallus beldingi)* were common. The habits of the rails were not unlike those of their near relatives, found in the marshes in California, with the exception that they were very willing to flush. They seemed to depend for safety a great deal on their slow, short, unsteady flights and resorted to this mode of escape whenever they were approached, even in the dense cover of the rushes. The collection of a good series of specimens was thus easy. An explanation of this unusual habit might be found in the presence of a large population of coyotes that sought their food in these marshes. Coyotes were so abundant that well-beaten trails were to be found almost everywhere, and the most direct and easiest way through the mangroves was always over a coyote trail.

The greatest numbers of Louisiana Herons *(Hydranassa tricolor ruficollis)* were found about the tide pools bordered by the rushes and it was from one of these pools,

also, that on April 11 the writer shot a single immature White Ibis *(Guara alba)*—the only one seen by him in the lagoon—as it flushed with a flock of 20 Louisiana Herons. Included in this assemblage, also, were three American Bitterns *(Botaurus lentiginosus)*.

As the tides receded, vast mud flats were laid bare and upon these myriads of shore birds were found. These included great flocks of Marbled Godwits *(Limosa fedoa)*, Long-billed Dowitchers *(Limnodromus griseus scolopaceus)*, Red-backed Sandpipers, Least Sandpipers *(Pisobia minutilla)*, Western Sandpipers *(Ereunetes mauri)*, and, in lesser numbers, Long-billed Curlews *(Numenius americanus)*, Hudsonian Curlews *(Phaeopus hudsonicus)*, Western Willets, Greater Yellow-legs *(Totanus melanoleucus)*, and Sanderlings *(Calidris alba)*. In fact, the writer had never before in his lifetime seen such countless throngs of shore birds. Belding Plovers *(Pagolla wilsonia beldingi)* and Western Snowy Plovers *(Charadrius nivosus nivosus)* were found in limited numbers.

A bunch of about 200 Black Sea Brant *(Branta nigricans)*, discovered feeding on a point, April 18, swam away in stately array as our motor skiff approached. At this same spot, nine Bonaparte Gulls *(Larus philadelphia)* were seen, part of their number performing the characteristic hovering flight over those resting on the mud. I was informed by Captain Seely that, on his fishing trips to this lagoon during the winter time, Black Sea Brant and most of the common ducks are to be found in enormous numbers, and that Pacific Man-o'-war-birds *(Fregata minor palmerstoni)* are not uncommon at that season.

On the more elevated parts of the marsh, reached only by the highest tides, a different type of vegetation prevailed. Here a scattered growth of *Salicornia* was interspersed with a rank carpet of *Monanthochloe*, and in this growth the Marsh Sparrows built their nests. Several Western Willets were found in this association on April 18, and at the writer's approach two of the birds set up such a clamor, flying close overhead and calling in a plaintive voice, much as do Killdeers, that an hour was spent carefully searching all promising spots for the bare possibility of a nest. None could be found, though the birds did not leave the locality; their activities were probably merely prenuptial manifestations. At this same time a lone American Duck Hawk *(Falco peregrinus anatum)* was observed rapidly flying over the marsh in search of prey. It was not an uncommon sight to see American Ospreys *(Pandion haliaëtus carolinensis)* searching the larger streams and channels of the bay for food.

POND LAGOON

Pond Lagoon is the most westerly of the three lagoons situated in the Southern Vizcaino Desert group, and its entrance lies about 8 miles west of Abreojos Point. The period between April 13 and April 17 was spent in this lagoon.

The entrance is decidedly dangerous and, according to Captain Seely, has been navigated by very few mariners. The channel is narrow, in some places less than 100 feet wide, with extremely shallow water on the bar. At the time of our entrance, we had less than two feet of water under the keel of the boat and, had not conditions been entirely favorable, the passage could never have been made.

This lagoon is a long estuary about 8 miles in length and not over a mile at its greatest width. It parallels the ocean shore in a southeasterly direction and the upper reaches lie just back of Abreojos Point. The southern shore is composed entirely of wind-blown sand and is devoid of vegetation, while the northern shore harbors large mangrove thickets interspersed with glades of *Spartina* grass. The mangroves do not extend along the entire northern shore line, but grow only as far as fresh sea water reaches them with each tide, a distance of approximately 6 miles. The extreme eastern

end of the lagoon is not broken up into many small sloughs as is shown on the chart (No. 1294, Hydrographic Office, U. S. Navy) but there is one large slough that winds about, snake-like, through a *Salicornia* marsh. At the time of our visit, this marsh looked as green and level as a new lawn. Several stately American Egrets were seen here and their presence left a mental picture never to be forgotten. This marsh is the locality where, on April 19, 1897, R. C. McGregor took the type and series of his *Ammodramus halophilus* (Auk, xv, 1898, pp. 265-267) and hence was of particular interest to the writer.

The close proximity of this quiet body of water to the ocean attracted many species of birds that were not found in San Ignacio Lagoon. Thus, we found Southern Western Gulls *(Larus occidentalis wymani)*, Farallon Double-crested Cormorants *(Phalacrocorax auritus albociliatus)*, California Brown Pelicans, Royal Terns and Coues Caspian Terns visiting this body of water daily in small numbers.

Great flocks of shore birds were present, the same species being represented as were listed for San Ignacio Lagoon. Ducks were also there in flocks, the largest number being Lesser Scaup Ducks *(Nyroca affinis)*, of which fully 2000 were divided in two flocks. A small flock each of American Pintail Ducks *(Dafila acuta tzitzihoa)*, Surf Scoters *(Melanitta perspicillata)*, and Canvas-back Ducks *(Nyroca valisineria)* was noted, and Red-breasted Mergansers were as abundant as they were at San Ingacio Lagoon. Incidentally, Black Brant were missing, though the place seemed well suited to their needs. Many American Eared Grebes *(Colymbus nigricollis californicus)* were seen and one became tangled in the fishing net on April 13 when we were seining a mullet "hole."

As the writer was tramping over the sand spit that divides the lagoon from the ocean, on April 14, a lone American Pipit *(Anthus rubescens)* was noted, and half a dozen Frazar Oyster-catchers *(Haematopus palliatus frazari)* were seen at rest above the wash of the waves on the ocean shore. On the lagoon side, an occasional California Least Tern *(Sterna antillarum browni)* flew past, hovering now and again to drop upon a fish.

The mangroves in Pond Lagoon were exceptionally interesting. This locality marks the most westerly point of their growth on the American continent and also the northern limit reached by mangroves on the Pacific side of the Lower California peninsula. Amid this growth, Mangrove Warblers and Frazar Green Herons also find the northern limit of their range. Belding Rails were abundant, though the larger herons were not as common as they were found to be in San Ignacio Lagoon. The much smaller area of mangroves was, no doubt, the determining factor. Several Great Blue Herons *(Ardea herodias* subsp.?) were seen, but they were far too wary for the securing of specimens, and their identity remains unknown. During the late afternoon of April 16, the writer shot a Virginia Rail *(Rallus virginianus)*, but was not successful in retrieving the specimen. The bird flushed very close and was dropped in a dense growth of marsh grass. Several Western Belted Kingfishers *(Megaceryle alcyon caurina)* lived about the sloughs in Pond Lagoon and were seen almost daily during the stay. It might be added that both Northern Turkey Vultures *(Cathartes aura septentrionalis)* and Western Ravens *(Corvus corax sinuatus)* were abundantly seen about both lagoons throughout the trip.

Altogether fifty-seven species of birds were recorded in the localities of the two lagoons, the first, incidentally, being the same as the last, namely the Parasitic Jaeger *(Stercorarius parasiticus)*. One of these birds flew past the boat when it was off Abreojos Point on April 10, and again, as the party was on the ocean, returning north on April 19, a lone individual was observed just off the entrance to Pond Lagoon.

San Diego, California, June 2, 1927.

THE AMERICAN MAGPIE IN THE OKLAHOMA PANHANDLE

By RALPH C. TATE

IT HAS BEEN SUGGESTED to me on several occasions during the past year that some remarks on the appearance of the American Magpie (*Pica pica hudsonia*) in the Oklahoma Panhandle might be of considerable interest to a number of bird students in the western and plains sections of the country. For this reason, therefore, I am pleased to present the following facts gleaned through personal observation and study and from the notes of certain of my acquaintances.

I have lived in Cimarron County, the extreme western county of the Oklahoma Panhandle, from my early boyhood, and during the last eighteen or twenty years I have devoted a considerable amount of time to the study of the birds and small mammals of not only the panhandle area but of the adjoining territory in eastern New Mexico, southern Colorado and Kansas, and northern Texas. On field trips that early led me into Union County, New Mexico, and Baca and Las Animas counties, Colorado, I became familiar with the American Magpies that inhabited the tree-clad hills and brush-choked valleys of these three counties in fairly large numbers. It soon occurred to me as odd, however, that, while within eight or ten miles of the Oklahoma-New Mexico and Oklahoma-Colorado boundary lines these loud voiced and extremely conspicuous birds were almost as numerous as they were twenty-five or thirty miles farther west, yet none was to be found within the boundaries of Oklahoma itself. I began keeping a close watch for an individual in Cimarron County or even within three or four miles of its boundaries, and requested numbers of my rancher friends to keep a look-out and notify me if they chanced to see one while riding their ranges in that area.

Despite the watchfulness of myself and my cowboy friends, however, a number of years passed before there was a record of a magpie being seen nearer than seven or eight miles of Oklahoma. Then, in 1919, three pairs of the birds appeared on the A. L. Brookhart ranch nearly twenty miles east of the Oklahoma-New Mexico line and three miles south of the Oklahoma-Colorado line—approximately thirty miles east of their former known range. This established the first record for the species in Oklahoma, to be followed soon after by records of an occasional straggler being observed at Gate, Oklahoma, by W. E. Lewis.

Evidently finding the region much to their liking, the six magpies nested on the Brookhart ranch in 1919, and since that time the species has been permanently resident there, with the result that a flock of from fifteen to twenty or more is present the year around. During the nesting season it is possible to find from one to several nests in an hour's walk through the hackberry thickets along two spring-fed creeks.

It is interesting to note in connection with this long eastward extension in range into the Oklahoma Panhandle that these birds have also extended their range eastward into extreme western Kansas, as a recent record in the CONDOR shows. The record in question (Linsdale, Condor, XXVIII, 1926, p. 179) is for nesting in Hamilton County, Kansas. Linsdale's article cites Bunker, in his "Birds of Kansas", as stating that the magpie is a rare winter visitant in western Kansas. Goss is also cited as writing in his "History of the Birds of Kansas", "formerly a resident; rare". More is given in the article in question along this line, but aside from the following which Linsdale

mentions from Goss' "Revised Catalogue of the Birds of Kansas", I will quote no further. This is to the effect that the species was found nesting in Graham County, Kansas, in the summer of 1873 or 1874 by a Mr. Jeff Jordan. "The birds were not seen after 1875." In their handbook, "The Birds of Oklahoma" (1924), Margaret Morse Nice and Leonard Blaine Nice, in addition to citing the records of Mr. Lewis for Gate and my record for Cimarron County, go on to state that the magpies are extending their range to the east in North Dakota and Iowa.

While the flock on the Brookhart ranch contains the only members of the species that seem to be year-round residents in Cimarron County, yet it is only reasonable to suppose that in time this flock will divide and other flocks will be built up in widely scattered sections of the county. But whether or not this occurs, the flock now numbering twenty-two or twenty-three and which has occupied the same range for eight years is sufficient to give Oklahoma an authentic record of the American Magpie as a resident.

Kenton, Oklahoma, April 14, 1927.

FROM FIELD AND STUDY

The Cardinal in San Diego.—From May 10 to 14, inclusive, of this year I saw a male Cardinal (*Cardinalis cardinalis* subspecies) daily in Balboa Park, San Diego. My identification of the bird was verified by Mr. Clinton G. Abbott, of the San Diego Natural History Museum. Inquiry at the Zoo revealed that the officials there have no record of an escape of this species, nor do any of the employees know of such an escape. Rumor persists, however, in crediting the arrival of this species to that source. The bird is an adult male but lacks the rich coloring of typical *cardinalis;* it is either a faded cage bird or of the subspecies *superbus.* Several other reports of a Cardinal in this city have been received this spring; but whether there is more than the one bird has not as yet been ascertained.—FRANK F. GANDER, *East San Diego, California, May 21, 1927.*

Breeding of Immature Hawks.—The mating of an immature hawk with an adult has often been recorded. In some instances this is the result of a female being shot and its mate rounding up an immature to help him to bring up the young, or even to hatch the eggs already laid. A definite instance of an immature of the preceding year laying eggs is as follows.

On April 30 of this year I shot a female Cooper Hawk, an adult that would have laid its first egg in a week. A week later I saw the male ranging the country in quest of a new mate. On May 18, a neighbor asked me to shoot a hawk that had been killing her chickens for two weeks not far from where I shot the female on the last day of April. I soon found the nest and shot the occupant, an ordinary brown immature bird of the preceding year. On dissection this bird proved to contain three eggs; the largest egg would have been laid next day. The rest of the set were probably in the nest to which I did not climb. The male I got over a week later some two miles away.

The valley in which the nest was located had originally at least four pairs of Ruffed Grouse. All or nearly all were killed by these hawks inside of a month. The greatest asset in collecting hawks is the ability to imitate the hoot of the Great Horned Owl. At the nest this is an infallible means of bringing up the owners; in the cases of Falcons, Goshawks, Cooper and Sharp-shinned hawks the birds usually come right up with loud outcries, the males being bolder than the females. In hawks of the *Buteo* type the attraction is just as effective but the hawks are more wary.

I have records of the acquiring of an immature mate after the first adult mate had

been shot, in the following species: Peregrine, Pigeon Hawk, Sharp-shinned and Cooper hawks. In the case of the Pigeon Hawk it was the female that acquired three successive mates, the last a brown immature. As it is now recognized that all hawks (except eagles) pass into the adult plumage at their first moult, these immatures must in every case have been less than a year old.—ALLAN BROOKS, *Okanagan Landing, B. C., June 30, 1927.*

A Note on the Dietary Habits of the Barn Owl.—The abode of a pair of Barn Owls *(Tyto alba pratincola)* was discovered on October 4, 1925, the nesting and roosting place being located in a cave in the cliffs of Wildcat Canyon about three miles north of the University of California campus, Berkeley. Pellets were collected at intervals over a period of one and one-half years in an attempt to learn whether there be any significant seasonal variation in the relative numbers of the different animals taken by the owls for food. The observations were interrupted by press of other duties sooner than was expected. The results are presented in the table herewith. For the sake of brevity the several collections of pellets are condensed into two categories, those belonging to the dry season (March to November) and those of the rainy season (November to March).

A total of 571 pellets yielded 1780 individual animals, recognized from the skeletal remains found in the pellets. Of the mammals, by far the most numerous was the common California meadow mouse, which comprised 64 percent of the catch. In order of decreasing frequency were white-footed mice (mostly *Peromyscus maniculatus gambeli*, together with a few which were probably *P. truei gilberti*), harvest mice *(Reithrodontomys)*, pocket gophers *(Thomomys)*, shrews *(Sorex)*, and pocket mice *(Perognathus)*, with a few scattering individuals of wood rat *(Neotoma)*, mole *(Scapanus)*, brush rabbit *(Sylvilagus)*, house mouse *(Mus)*, house rat *(Rattus)* and one kangaroo rat *(Dipodomys)*, the last named of rather rare occurrence in this locality. In the late summer and autumn the Jerusalem cricket *(Stenopelmatus)* is represented quite numerously in the pellets.

	Actual number of individuals			Relative number of individuals (percent of catch)		
	Dry Season: March to November	Rainy Season: November to March	Total	Dry Season: March to November	Rainy Season: November to March	Total
Microtus	767	364	1131	60.00	72.00	64.00
Peromyscus	196	44	240	15.00	8.73	14.00
Reithrodontomys	116	37	153	9.10	7.30	8.60
Thomomys	51	34	85	4.00	6.70	4.80
Sorex	31	2	33	2.40	.40	1.80
Perognathus	14	2	16	1.10	.40	.90
Scapanus	2	5	7	.16	1.00	.40
Neotoma	6	2	8	.47	.40	.50
Sylvilagus	1	1	2	.08	.20	.10
Stenopelmatus	84	15	99	6.60	3.00	5.60
Mus	2	0	2	.16	.03	.10
Rattus	0	2	2	.00	.40	.10
Dipodomys	1	0	1	.08	.00	.05
Total	1272	508	1780			

In regard to seasonal variation of the dietary, nothing very striking was found. The shrews, pocket mice and Jerusalem crickets were taken mostly in the dry season but these species make up only a small part of the catch. White-footed and harvest mice were taken somewhat more frequently in the dry months, whereas the reverse is true of the pocket gophers. Finally, certain animals are conspicuous by the complete absence of their remains from the pellets. No bird remains were found. There were no ground squirrels, which is good evidence that these animals have retired to their burrows before the owls come out to hunt. Nor were there any remains of jack rabbits, though the writer has often seen these animals abroad at night on hill sides where barn owls are seen and heard.

The writer expresses his thanks to members of the staff of the Museum of Vertebrate Zoology, especially to Mr. Joseph Dixon, for the help received in the identification of material from the pellets.—G. L. FOSTER, *Berkeley, California, July 1, 1927.*

California Brown Pelicans Nesting at Point Lobos, Monterey County, California.—During the last two summers I had, from time to time, observed that a number of Cali-

fornia Brown Pelicans *(Pelecanus californicus)* frequented a little island on the south side, and at the base, of Point Lobos. From the mainland I could see the birds sitting on suspicious-looking piles of sticks on the top of the island. Of course I knew that if these were actually nesting birds, it would establish a new northern breeding limit which heretofore has been accepted as Anacapa Island, fully 200 miles to the southward. When I mentioned the matter to an ornithologist friend, he took no stock in my surmise. Nevertheless, I thought it worthy of investigation.

But this three-acre island, although it is not more than a few hundred feet from Point Lobos, is extremely difficult to land on, because of constant high seas and the

Fig. 75. ISLAND NEAR POINT LOBOS, MONTEREY COUNTY, CALIFORNIA, OCCUPIED BY A NESTING COLONY OF CALIFORNIA BROWN PELICANS.

Fig. 76. NEARER VIEW OF PELICAN COLONY NEAR POINT LOBOS, CALIFORNIA.

rocky shores. Morover, there are no boats available in the immediate vicinity. So my conjecture was not proven correct until May 25, 1927.

A friend in Carmel, Mr. David Prince, suggested that we borrow the catamaran belonging to another mutual friend, living directly opposite this island. This catamaran is nothing more than a raft of two hollow pontoons, each a foot wide and about six feet long, connected by several slats for seats. To navigate the craft, two persons sit on the slats, one at the bow, the other at the stern, and dig at the water with ordinary canoe paddles. The water comes to the top of the pontoons and waves lap over it all the time. It is quite necessary, therefore, to wear bathing-suits. The craft, however, is quite safe, that is, it will always float, provided the plugs in the vents of the pontoons do not come out.

I accepted the invitation to take this perilous voyage more in the spirit of a lark than with the idea of settling in a scientific way the question concerning the pelicans. Under the circumstances, how could I safely bring equipment with me to do the work properly? It wasn't even possible to carry a note-book and pencil!

Our route to the place of landing, my friend told me, would be through the "inland passage". He might have said the *underland* passage, for we had not gone far when we proceeded toward a cavern under the cliffs of the mainland. In the mouth of it we waited till a large roller came along and carried us in. The grotto was not more than six feet wide, but it was quite high and long. When we were half-way through, the wave receded and started to suck us back. We had to paddle furiously to hold our own. At last the wave changed its direction again and with great speed shot us out at the other end. We found ourselves in a little cove almost surrounded by cliffs. At one end was another cavern through the rock, even narrower than the first. To this hole my friend steered us. When half-way through, the side of the raft caught on a projecting piece of rock as the rising wave buoyed us up. We could not move. The water rose over the raft; the raft tilted precariously; we were immersed to our waists. And we weren't freed till the wave went down again. Suddenly my friend exclaimed, "The plug's out." I glanced, horrified, at the hole in the pontoon, with water entering fast. But luckily the plug was floating just within reach.

Fig. 77. NESTS AND EGGS OF CALIFORNIA BROWN PELICAN ON ISLET NEAR POINT LOBOS.

At last we landed on the one place on the island where the rocks are shelving. The island, although small, reaches quite a height. There are two knolls on top of the hill which suggest the humps of a camel. All sides of these knolls are steep except the north side. Here the slope is covered by a low but exceedingly thick and matted growth of poison oak. When we approached the island, these knolls were covered by pelicans which flushed as soon as we landed. On crossing a grassy place at the foot of the knolls, we found several nests with eggs of the Western Gull. About 200 nests of the Brandt Cormorant were discovered on the edge of the cliffs, also containing eggs.

To reach the place where the pelicans were, we had to walk through the poison oak. The growth was so thick, however, that we found ourselves walking *on top* of the plants. On the very summit of the hill we found the pelicans' nests, just where I thought they might be. Upon the eastern knoll were twenty or thirty nests, though only a few were more than rude bundles of sticks. But on the two knolls, we found altogether ten well-formed nests containing eggs. Of these, eight contained two, one contained one egg, and another held three eggs. From the set of three, I took one, wrapped it in a handkerchief, which one of us had in an old pair of trousers worn over his bathing suit, and tied it securely to my shoulder strap. This egg is now no. 2031 in the collection of the Museum of Vertebrate Zoology.

Because it was a foggy day, with a cold wind blowing, our visit was necessarily cut short. Three weeks later (June 16) I succeeded in hiring a launch at Pebble Beach, about five miles away. After coming all that way, it seemed at first impossible to land because of the high seas. But, by sacrificing my bulky 4 x 5 camera and only taking the two hand cameras, I was able to jump from the rowboat onto the cliff. Nearby a Black Oystercatcher scolded loudly. I estimated the number of California Brown Pelicans on top of the island as about 85, and possibly another 70 more were perched on the neighboring rocks. However, this time there were only eight nests with eggs, six

with two eggs, and two with one apiece. A chick was in the process of emerging from its egg as I watched. When I returned from inspecting other nests, it had freed itself. The color of its skin was purplish blue. *

The question whether this is a new colony of nesting pelicans formed since the days when Loomis and Beck studied this region, or whether these gentlemen never discovered the nests because of the island's inaccessibility, seems at present to be undetermined. Perhaps, judging from the meagre numbers, the colony has come into existence only recently, assembled from migrating or winter-visiting birds.—LAIDLAW WILLIAMS, *Carmel, California, July 26, 1927.*

Freak Nesting Site of a Magpie.—During a walk on the morning of June 5, I had occasion to cross the Frenchman River by the railway bridge nearby. As I was stepping over the ties I heard the "wheezing" of young birds right under my feet. Getting down on my knees and peering through an inch space between two cross girders that were level with the ties I could see, just below, five or six nestlings with mouths agape. I took them for young crows and had no time just then to wait for a parent bird to appear; but on visiting the nest a week later I could tell by the black and white feathering that they were Magpies (*Pica pica hudsonia*).

The nest is directly under one of the rails and between two ties. It is supported by two intersecting braces and protected from above by the aforementioned girders. The usual "dome" is, therefore, absent, being both unnecessary and impossible in the restricted space available; and altogether there is not much nest, but for security it could scarcely be improved upon. The parent bird would come and feed the young while I was standing overhead, but would not venture so far when I stood looking up from below.

It would have been interesting to know whether the sitting bird maintained her position during the deafening roar of a passing train, only about 18 inches above her head, though the regular service is not more than one train per day. Under the rail opposite is another, half finished nest which was apparently abandoned in favor of the present site.—LAURENCE B. POTTER, *Gower Ranch, Eastend, Saskatchewan, Canada, June 14, 1927.*

Can Hawks Prevent Mouse Plagues?—An editorial note in the May issue of the CONDOR (XXIX, 1927, p. 172) supports Mr. Wyman's contention that the control of mouse or other rodent plagues lies in protecting their natural enemies, both winged and four footed. Now, while I am most anxious to see useful hawks protected it is more than doubtful that either these or mammalian mouse destroyers can prevent the plagues that periodically occur in many species of rodents.

I spent a large part of the year 1923 in California, in the San Joaquin Valley and the southern portion of the Sacramento Valley. Hawks were especially plentiful and a few were seen lying dead by the roadside, the victims of ignorant gunners, but only a few. At Snelling, Merced County, only some 180 miles north of the region where the mouse plague occurred in the latter part of 1926, hawks were more numerous than I have seen them at any point in North America in the last forty-six years, and my wanderings during that period cover a pretty wide field. On January 2, 1923, just four years before the height of the mouse plague I counted 120 hawks of the *Buteo* type in the air at once. This was not a migrating assemblage but just a normal concentration near a roosting point. Redtails constituted the majority of this gathering, Ferruginous Rough-legs, the "notably scarce or altogether wanting" California Squirrel Hawk, were well represented, and a few Red-bellied Hawks completed the list. All of these are notable mouse catchers and in addition Marsh Hawks and Sparrow Hawks were abundant and seen at all points in the San Joaquin and Sacramento valleys.

Owls of several species were also numerous as well as coyotes, skunks, coons and weasels. In fact never in my life have I seen such a notable abundance of mouse catchers, including feral domestic cats in extraordinary numbers. Yet only four years later comes this devastating plague of rodents!

* On August 4, 1927, Dr. Louis B. Bishop with some friends and myself visited the island. We found eight young pelicans, all covered with down except where the juvenal plumage was coming through at the primaries, secondaries and scapulars, and on the head and tail.—L. W.

As a matter of fact mouse plagues as well as a swarming abundance of other rodents, rabbits, voles, lemmings, etc., may occur almost anywhere and are probably the result of some special abundance of food coupled with a freedom from disease for a number of consecutive years. Then disease comes and the species is all but exterminated. Such irruptions of rodents have been recorded in history from the earliest times, centuries before the decrease of raptorial birds and mammals.

In the subarctic regions the periods of abundance and scarcity in such rodents as voles, lemmings and hares is cyclic in spite of the abundance of their natural enemies. The wonderful work of the Biological Survey has shown how rodents may be controlled, even to the point of extermination over wide areas. In time they will be able to cope with any outbreak; let us help their efforts in every way and not place undue trust in the feeble domination of the natural enemies of rodents. In time, when bacterial inoculation may be the means employed to reduce rodents the abundance of hawks and owls may be distinctly harmful, as the infected mammals which should be spreading disease would be the easiest victims to predatory birds and mammals.—ALLAN BROOKS, *Okanagan Landing, B. C., July 10, 1927.*

EDITORIAL NOTES AND NEWS

A most worthy undertaking is that just launched by the United States Biological Survey, to obtain a monthly census of water-fowl at selected points throughout North America. Doctor Oberholser is in immediate charge of this activity, and these auspices guarantee an energetic, well-organized effort toward a definite object. Too long has dependence in the formulating of game laws been left to hearsay, to the testimony of the casual sportsman, and to mere impression on the part of the better informed. Now, we are in line to get accurate, quantitative data—*if* Dr. Oberholser can be given adequate support by numerous good field observers who are in proper geographic locations. We recall as a fine type of such observation, Kibbe's study of the ducks on Lake Merritt, Oakland, as published in the CONDOR for March, 1925. Details of this new plan to obtain a nation-wide census of ducks and other water-fowl can be obtained by addressing Dr. H. C. Oberholser, Biological Survey, Department of Agriculture, Washington, D. C. Let Cooper Club members aid him to the full extent that individual circumstances permit. Accurate knowledge of the numbers, distribution, and migration of our important game species is an absolute prerequisite to any proper move toward the conservation of this valuable national asset.

It should go without saying that the pages of the CONDOR are freely open for discussion on both sides of any ornithological question. Such discussion can be vigorous without, of course, verging at all on the personal. For example, in the present issue we (editorially) welcome Major Brooks' plain expression of his views on mouse plagues versus hawks — this despite the fact that "we" (the Editor personally) dissent from his statements and conclusions in just eight different points, by count! This is a two-sided question, and we urge that such of our readers as have definite evidence or logical opinion to offer, on whichever side these bear, contribute their offerings to our "field and study" department.

MINUTES OF COOPER CLUB MEETINGS

NORTHERN DIVISION

JUNE.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held at the Museum of Vertebrate Zoology, Thursday, June 23, at 8:00 p. m. In the absence of president and vice-president, the Club requested Mr.

Grinnell to act as chairman. Forty-two members and visitors were present. The minutes of the Northern Division for May were read and approved. The minutes of the Southern Division for May were read by title. A resolution passed by the Southern Division, expressing sympathy to Mr. Robert Ridgway in the loss of his wife, was read and warmly endorsed by vote of the Northern Division.

Two proposals for membership were presented: Miss Cecelia Carnahan, 101 Plaza Drive, Berkeley, Calif., by Mrs. Bessie W. Kibbe; Miss Elsa Blackman, Rose Walk and Euclid Avenue, Berkeley, Calif., by Ralph Ellis, Jr.

Mr. Wanzer reported finding a nest of Townsend Solitaire in a cut bank at the edge of the dusty Placerville highway a few years ago, and this year two other nests of the same species in Amador County in identical situations. Mrs. Mexia and Mr. Grinnell confirmed Mr. Wanzer's observations, that nesting on cut banks is now customary with this species.

Reporting on recent literature, Mr. Grinnell commented at length upon "Birds of the Pacific States" by Ralph Hoffmann. He quoted from the title page, which states in concise terms the nature of the book. The illustrations were made by Allan Brooks. The colored plates show his usual unexcelled workmanship, although the press-work in some cases has not done justice to the drawings. Most of the illustrations, however, are a departure from the artist's usual style, being black and white pen drawings. These are well drawn and fulfill the requirements of the book. Mr. Hoffmann is entirely qualified through years of careful field study and accurate note-taking to undertake such a publication, and the book is in fact what it was meant to be, a field guide, rather than a text to be used in the laboratory. Mr. Grinnell read the entire description of one species as a sample of the plan used in the text.

The program of the evening was given by Mrs. Ynes Mexia who has recently returned from a seven months' collecting trip in Mexico. While the expedition was expressly for the collecting of botanical specimens, Mrs. Mexia's interest in birds was keen, and she was alert to make as many observations as time and botanical collecting would permit. She saw many birds, some of which were old friends from the homeland sojourning in Mexico, but more of which were either remotely like our northern species or entirely new to her. Most vividly impressed on her memory was the sight of a large flock of Roseate Spoonbills seen against a rose-colored sunset sky. A number of species were mentioned in detail, and specimens exhibited. Mrs. Mexia interwove into her remarks a number of entertaining accounts of her visits to various towns and of her experiences with various modes of travel.

At the close of the program two rare, unpublished volumes of colored drawings of Mexican birds were exhibited. These original drawings are the work of Andrew Jackson Grayson, made between the years 1857 and 1869. They were to have been published as "Birds of the Pacific Slope", but the artist died before completion of the drawings. The plates have been bound and are the property of the Bancroft Library at the University of California; they were loaned for exhibit at this meeting through the courtesy of Professor Priestley of the Bancroft Library.

Adjourned.—MARGARET W. WYTHE, *Secretary pro tem.*

JULY.—The July meeting of the Northern Division of the Cooper Ornithological Club was held on July 28, 1927, at 8:00 p. m., in Room 101, Zoology Building, University Campus, Berkeley.

In the absence of the president and vice-president, Dr. Barton W. Evermann was called upon to occupy the chair. About one hundred and twenty members and guests were present. Minutes of the Northern Division for June were read and accepted. Minutes of the Southern Division for June were read by title. The name of Mr. D. E. Danby, P. O. Box 160K, Route 3, Santa Cruz, California, was proposed for membership by Mr. Clark P. Streator.

Dr. Theodore Sherman Palmer, of Washington, D. C., was the speaker of the evening and his topic was "Early Western Ornithologists". A study of the history of the men whose lives are remembered in the names of one hundred and forty of our western birds has been Dr. Palmer's recreation for several years past. The intensely interesting excerpts given from the facts which he has gathered left his listeners eager for the promised publication of his entire manuscript in the CONDOR. Each member was in enthusiastic accord with Dr. Evermann's closing statement of the Club's indebtedness to the speaker for the evening's enjoyment. Adjourned.—HILDA W. GRINNELL, *Secretary.*

SOUTHERN DIVISION

MAY.—The regular monthly meeting of the Southern Division of the Cooper Ornithological Club was held at the Southwest Museum, Los Angeles, on May 31, 1927. President Appleton called the meeting to order at 8:15 p. m., with about twenty-five members and friends present. The minutes of the April meeting of the Southern Division were read and approved. The minutes of the April meeting of the Northern Division were read.

The following applications for membership were read: Eugene R. Pike, 191 East Walton Place, Chicago, Ill.; Mrs. H. D. Foulk, 2312 Stuart St., Berkeley, Calif.; H. W. Betts, Dawson, Yukon Territory, Canada; G. E. Springer, 2082 Oakland Ave., Piedmont, Calif.; and Ralph L. Hand, Kooskia, Idaho; all proposed by W. Lee Chambers.

Mr. Wyman spoke of the recent death of Mrs. Robert Ridgway and presented the following resolution which was unanimously adopted.

WHEREAS, after the manner of inscrutable Providence, Mr. Robert Ridgway has suffered the loss of the companion of his long and useful life, and

WHEREAS, the Southern Division of the Cooper Ornithological Club knows the extraordinary affection existing between Mr. and Mrs. Ridgway for more than forty years, and the inspiration and invaluable assistance she had been to him in his ornithological work; now therefore, be it

RESOLVED that the Secretary of this Division of the Cooper Ornithological Club be instructed to express to Mr. Ridgway the deep and sincere sympathy of the members in the dark hour of his bereavement; and be it further

RESOLVED that this resolution be spread upon the minutes of this Division, and a copy be sent to the Secretary of the Northern Division of the Cooper Ornithological Club.

(Signed) Harry Harris
Louis B. Bishop
L. E. Wyman.

Mr. Chambers gave an interesting account of the Annual Meeting of the Cooper Club held in Berkeley and San Francisco, April 29 to May 1, inclusive, and spoke very highly of the way in which this meeting was conducted throughout all its sessions, as also of the entertainment features.

Mr. Roland C. Ross was the speaker of the evening. He told in his interesting way of several visits, with a group of biology students and their instructors from the Pasadena High School, to the Santa Barbara Islands off the coast of Southern California, of the structural formation of these islands, and of their bird life and their animal life generally. He described in considerable detail the distinguishing characteristics of the shearwaters and the fulmars by which they can be recognized when seen in their natural habitat, the open ocean. The shearwaters are well named because of their way of shearing the water when alighting or taking off; the fulmars settle down onto the water after stopping their forward velocity with their wings. The shearwaters are shy, the fulmars bold and rapacious. Mr. Ross told of the presence on the islands of many of our familiar mainland birds, some with local subspecific designations, and he painted word pictures about them that will linger long in the memories of those who heard him. Adjourned.—HAROLD MICHENER, *Secretary.*

JUNE.—The regular monthly meeting of the Cooper Club, Southern Division, was held at the Los Angeles Museum, Exposition Park, Los Angeles, on June 28, 1927. The meeting was called to order at 8:15 p. m. by President Appleton, with about twenty members and friends present. The minutes of the May meeting of the Southern Division were read and approved. The minutes of both the May and June meetings of the Northern Division were read.

The following applications for membership were read: James Vann Porter, Glenwood, Minn.; Karl W. Kahmann, Route 2, Hayward, Wis.; Frank H. Rose, Montana National Bison Range, Moiese, Montana; John Bossler, Hamburg, Berks Co., Penna.; Henry Ludlow Beadel, Tallahassee, Florida; Arthur Allen Andrews, 28 Dungan St., Canandaigua, New York; Christopher W. Greenwood, Elnora P. O., Alberta, Canada; all proposed by W. Lee Chambers; and also Clarence W. Whitney, Berkeley, Calif., proposed by H. C. Bryant.

Mr. Appleton told about a recent trip to the Fresno-Los Baños country, particularly to collect the eggs of the Forster Tern and the Pintail Duck, neither of which did he find. It was rather a disappointing trip for him, though he did find a few nests of various other kinds. The high waters of this year had drowned out many nests. Mr. Willett told of a recent trip to the waters about Santa Cruz Island and Catalina Island, primarily for the collection of marine specimens rather than birds. Mr. Wyman displayed a collection of South American hummingbirds recently acquired by the Museum.

It was moved, seconded and unanimously carried that the secretary be instructed to write to Mr. and Mrs. J. Eugene Law expressing the gratification of the members of the Cooper Club at hearing of Mr. Law's improvement after his very serious illness. Adjourned.— HAROLD MICHENER, *Secretary.*

For Sale, Exchange and Want Column.—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of 15 cents per line. For this department, address W. LEE CHAMBERS, *Drawer 123, Eagle Rock, California.*

FOR EXCHANGE—Duplicate copies Nuttall Bulletin; The Auk and many of the early minor bird magazines; standard and unusual works on ornithology; complete set Bent's Life Histories; several good local lists including *original* Roosevelt and Minot. Can use Baird, Brewer and Ridgway's Water Birds, Hearne's Journey, and other *early* North American Explorations. — C. J. PENNOCK, *Kennett Square, Chester Co., Pa.*

NOW ON THE MARKET — New French pocket prism binocular, 6-power, 11½ oz. weight, 25 mm., 110 yds. field, wheel and right eye cap focus, solid leather combination pocket and shoulder slung case with two straps; $16. Have a few used field-glasses and prism binoculars, including Mirakel 5-power; in perfect condition, satisfaction guaranteed. Pocket microscopes, 25-power $1, 50-power $4. Loupes, Coddington and tripod from 40 cents upward. —J. ALDEN LORING, *Box O, O-we-go, Tioga Co., N. Y.*

BIRD LICE WANTED—I am very desirous of obtaining specimens of Mallophaga (biting bird lice). Please place the specimens in small vials with a solution of about 70% alcohol. I wish to co-operate with fellow collectors and invite correspondence.—HAROLD S. PETERS, *Assistant Entomologist, Virginia Truck Experiment Station, Norfolk, Virginia.*

WANTED—To buy first class bird skins of the following families and orders: Anatidae, Columbae, Limicolae, Gallinae, Rallidae; especially foreign species. Address—H. B. CONOVER, *6 Scott St., Chicago, Ill.*

FRENCH OR GERMAN FIELDGLASSES, $5 up; stereo-prism binoculars, 8-power, $15 up. Mirakel 3 oz. universal focus monoculars with 20-power attachment that converts it into a microscope; 3½-power $10; same in 5-power $12.50. Watch for the new Mirakel 7-power, 7 oz. binocular, $35. Everything in glasses from a Zeiss down. Satisfaction guaranteed after trial, or money refunded.—J. ALDEN LORING, *Box O 182, O-we-go, Tioga Co., N. Y.*

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FOR SALE—Traps for bird banders. W. B. B. A. supply. Last word in traps. Folding 4-compartment Potter Trap, $5. Top-opening Warbler Trap, automatic, $5. Trap doors, consisting of door, frame and tripping treadle, 60c each. — WESTERN BIRD BANDING ASSOCIATION, *418 Elm Ave., Pasadena, Calif.*

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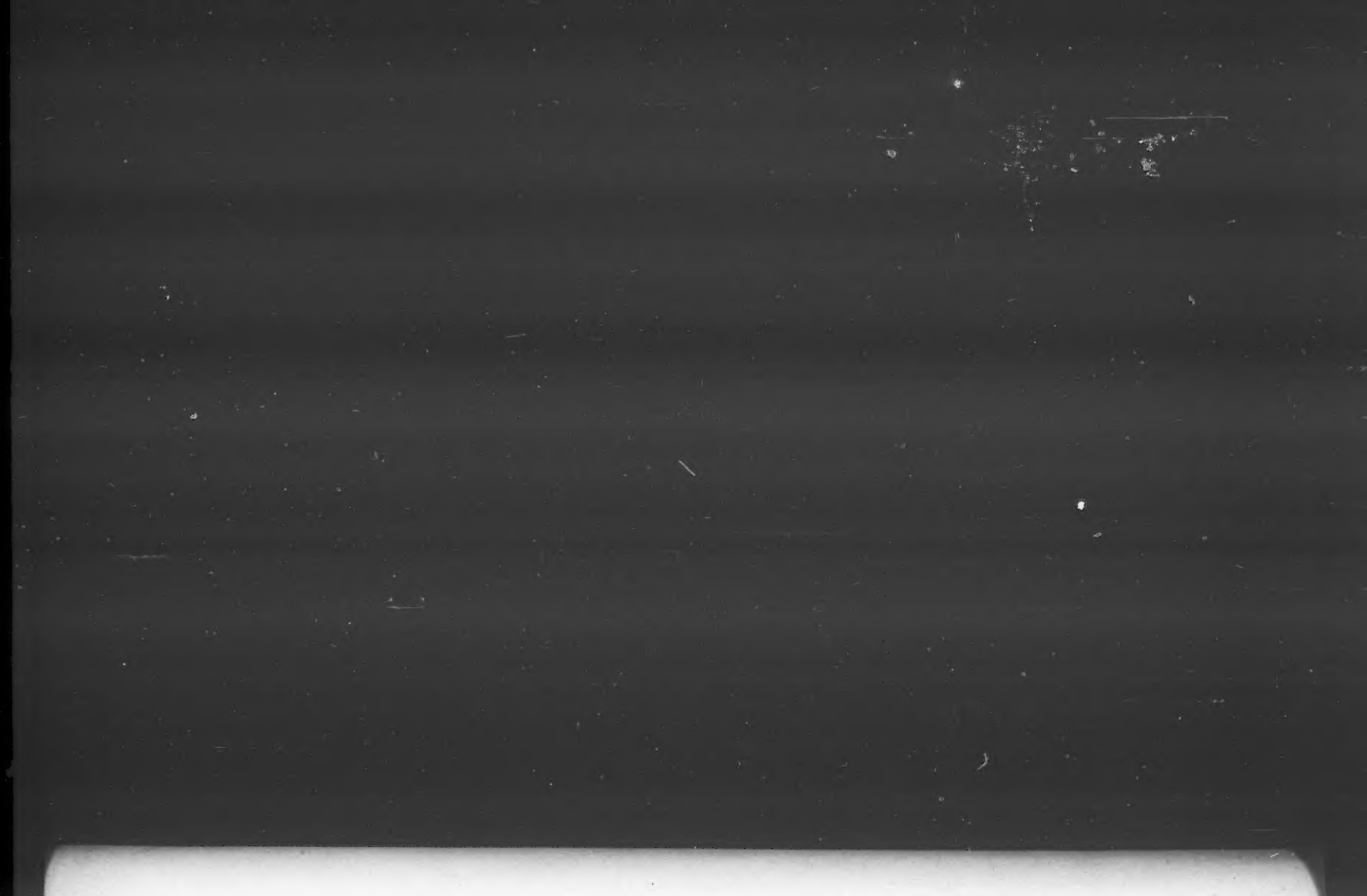
No. 6. Index to the Bulletin of the Cooper Ornithological Club, vol. 1 (1899), and its continuation THE CONDOR, vols. II (1900) to X (1908), by Henry B. Kaeding; 1909, 48 pp. Price $3.00 post paid.

No. 13. Second Ten Year Index to THE CONDOR, vols. XI-XX, 1909-1918, by J. R. Pemberton; 1919, 92 pp. Price $3.00 post paid.

These two volumes are obviously necessary to the completion of a file of THE CONDOR. In the "Second Ten Year Index" information is segregated by species under all the different names employed, by authors, by states and countries, in California by counties, and by subject matter.